RAILROAD GAZETTE

FRIDAY, MARCH 11.

## NEWS OF THE WEEK.

We give below, in a condensed form, the leading news items of the week. These items will be found in detail in their appropriate columns.

**Meetings this Week.**—Chicago, St. Louis & Pittsburgh, at Indianapolis.—Florida Railway & Navigation Co., at Fernandina, Fla.—National Association of General Passenger & Ticket Agents, Washington, March 15.

**Elections.**—Kansas, Nebraska & Dakota, H. M. Fickinger, Superintendent.—Niagara & San Jacinto, D. C. Reed, President.—Niagara Falls & Whirlpool, Ensign Bennett, President.—Peoria, Decatur & Evansville, D. J. Mackay, President.—Philadelphia, Marlton & Medford, George B. Roberts, President.—Wabash Western, O. D. Ashley, President; A. A. Talmage, General Manager.—Wabash, St. Louis & Pacific, Judge G. B. Burnett, Attorney for Illinois.—Washington & Elberton, T. B. Green, President; C. E. Smith, Vice-President.—United States Mail Service, Thomas E. Nash, Superintendent.—Atlantic & Charlotte, H. W. Sibley, President.

**Earnings.**—For Feb. 28, 45 roads report gross earnings, 36 showing increase and 9 showing decrease.

**Traffic.**—Anthracite coal shipments for week ending March 5 show increase of 19.9 per cent. over corresponding period last year; bituminous shows increase of 22.5; coke, for week ending Feb. 26, shows increase of 125.0 per cent. Cotton receipts, interior markets, show decrease of 11.7 per cent. as compared with corresponding period last year; shipments show increase of 69.0 per cent.; seaport receipts show increase of 17.1 per cent.; exports an increase of 53.9 per cent. Cotton in sight is less than at same date last year by 25.5 per cent.

**Changes and Extensions.**—*Alabama, Kentucky and Tennessee:* Louisville & Nashville builds several branches.—*Arkansas:* St. Louis & San Francisco extends line south from Fort Smith.—*Georgia:* Marietta and North Georgia will build branch of 10 miles.—*Georgia and Florida:* Savannah, Florida & Western will build from Thomasville to Tallahassee.—*Illinois:* Illinois Central will build branch from Clinton to Leroy.—*Iowa:* Des Moines & Fort Dodge will be widened and extended to Sioux City.—*Kansas:* Chicago, Kansas & Nebraska will build shops at Horton.—*Maryland:* Baltimore & Ohio surveys new branch.—*Massachusetts:* Work begins on Chatham & Harwich road.—*Mexico:* Mexican National and Mexican Central will both build into Guadalajara.—*Michigan:* Chicago, Milwaukee & St. Paul will extend road 50 miles northward.—*Minnesota:* Northern Pacific proposed to build a line up through Minnesota to a branch of the Grand Trunk in Manitoba. Minnesota & Northwestern will build between St. Paul and Minneapolis.—*New Jersey:* Spur track is being built on the Jersey meadows.—*New York:* Rome, Watertown & Ogdensburg contemplate an extension from Olcutt to Williamsville.—*North Carolina:* Atlantic, Tennessee & Ohio will be extended from Statesville to Taylorsville.—*Ohio:* Dayton & Ironton will be changed to standard gauge on April 3.—*Pennsylvania:* Pittsburgh & Western will build road between Evergreen and Perrysville. New road being graded from New burgh to Taylor Station. Lehigh Valley surveys new line from Allentown to Macunzie.—*Texas:* Fort Worth & Denver City complete track to Quanah. St. Louis, Arkansas & Texas makes survey from Commerce to Greenville.—*Vermont:* Bennington & Rutland will be extended.—*Virginia:* A new road is building west from Portsmouth.—*Washington Territory:* Puget Sound & Gray's Harbor expects to build 10 mile extension to Elma.

**Leases and Sales.**—Buffalo, Rochester & Pittsburgh, sale to Adrian Iselin confirmed.—Cincinnati, Jackson & Mackinac takes formal possession of the Michigan & Ohio.—Murphy, Ducktown & Cleveland's charter is transferred to a New York company.—New York, Chicago & St. Louis, decree of sale entered at St. Louis.—Philadelphia & Reading ordered to be sold by Judge McKennan. St. Louis & San Francisco passes under control of the Missouri Pacific.

**Reorganizations.**—Chicago & Atlantic bondholders agree to reorganize.

**New Companies Organized.**—Baltimore, Grafton & Charleston obtains charter in West Virginia.—Emporia, Winfield & Fort Scott chartered in Kansas.—Fargo, Grand Forks & Pembina incorporated in Dakota.—Fergus Falls & Southern incorporated in Minnesota.—Houston, Central Arkansas & Northern incorporated in Arkansas.—Kansas City, Linn & Southern incorporated in Kansas.—Newburgh & Poughkeepsie organized in New York.—Niagara & Jacinto incorporated in California.—Paducah, St. Louis & Chicago incorporated in Illinois.—Peoria & St. Louis Air Line incorporated in Illinois.—Selma & Alabama files charter in Alabama.—Solomon Valley, Gypsum & Gulf incorporated in Kansas.—Valley & Elk River obtains charter in West Virginia.—Wisconsin Midland incorporated in Wisconsin.—Carrabasset & Canada.

**Reports and Financial.**—Cleveland, Columbus, Cincinnati & Indianapolis for year ending Dec. 31 shows gain of 1.1 per cent. gross. Deficit of 1885 is decreased $185,248.—Illinois Central for the year ending Dec. 31 shows loss of 7.2 per cent. gross and 20.9 per cent. net. Balance for the year shows gain of 2.9 per cent.—Oregon Short Line for the year ending Dec. 31 shows gain of 5.9 per cent. gross and loss of 8.5 per cent. net.

**Miscellaneous.**—Canadian Pacific's new steamship line is to be subsidized by the British Government.—Central Vermont will build iron bridge at White River, Conn.—Cincinnati, Hamilton & Dayton will carry the Baltimore & Ohio Express business.—Eufaula & St. Andrews' Bay Co. buys 150,000 acres of land in Florida.—Hightstown & Pemberton, a serious derailment in New Jersey.—Illinois Central withdraws from all pools.—Lake Shore & Michigan Southern receives adverse judgment in freight discrimination suit.—Manhattan, frightful accident on 3d avenue elevated road, N. Y.—New road is to be built from Rockland to Camden, Me.—Ohio & Mississippi sustained in the express matter with the Baltimore & Ohio.—Pennsylvania company meets in Philadelphia.—St. Paul, Minnesota & Northwestern withdraws from the Northwestern Freight Association.

## Heating and Lighting Cars by Legislation.

A bill now before the Rhode Island Legislature provides for fire extinguishers and hand grenades to be carried on all passenger cars, and buckets on locomotives; for crow-bars, axes and saws on the outside of all passenger cars; that cars shall be lighted by gas or electricity; that no fire shall be lighted or built except in the locomotive; that no petroleum or naphtha nor any illuminating oil or fluid made in part or whole from naphtha, coal or petroleum shall be carried or used for lighting on passenger cars. The bill provides for a penalty of a fine not to exceed $1,000, one-half to go to the informer. On this bill the House Committee on Judiciary gave a hearing, March 4, to a number of representatives of railroad corporations and of heating systems. We present an abstract of the arguments:

Mr. Arnold Green, counsel for the Boston & Providence Railroad, referred to the decision of the Supreme Court of the United States in the case of the Wabash Railroad vs. The People of Illinois, last October, which he characterized as a surprise to many of the profession and a rebuke to the Supreme Court of this state, which hardly two months before had given an opinion to the contrary. In this decision the Court holds that a statute of a state intended to regulate or to tax or to impose any other restriction upon the transmission of persons or property or telegraph messages from one state to another, is not within that class of legislation which the state may enact in the absence of legislation by Congress; and that such statutes are void, even as to that part of such transmission which may be within the state. This has resulted in a great change in the estimate of the police powers possessed by the state, very greatly reducing them; and for this reason it behooves us to exercise great care in the passage of such acts. He instanced as showing the practical result of such acts the Massachusetts law requiring the use of one of five couplings. The Railroad Commissioners have agreed to ignore this act, because these couplings cannot be used with those used on the New York Central Railroad. If Rhode Island passes this law, and similar steps are taken by Massachusetts and Connecticut, transfer of passengers will probably result as a necessity at the state line. Mr. Green quoted Sections 4 and 5 of the act, and said that here was carefully incorporated a provision by which every human being who chooses to say that he has caught cold in the railroad train can bring an action for damages resulting from it. This act would also prevent the heating of passenger cars drawn at the end of a freight train, as trains on the Bristol road are. He ventured to assert that no train of more than six cars is or ever has been heated by steam. If adopted, this law would compel an experiment that is nothing more than tentative to be adopted, or else would prohibit the running of trains of more than six cars. Whenever there is a festival in Boston the Boston Railroad has to run trains of fifteen or sixteen cars: if it is required that these trains be broken up, it is simply impossible; they are running trains now almost in sight of each other. If the law is enforced, passengers will have to wait, or will have an action against the company for colds which they may take, for so many cars cannot be heated.

As regards the section requiring lighting by electric light or by gas, he had heard of that before; and he related the former experience in this state when candles were required; the Railroad Commissioner reported that all the roads disregarded the law but the Bristol road, and on this he stated it was carried out simply to make the law ridiculous. By electricity the light could be obtained only by storage batteries, and no one knows when they will go out, like the electric lights in our streets; or by dynamos, which stop when the train stops. There is no need of legislation that will compel the use of storage batteries, they will be used when some have been devised that will work and can be relied upon. Gas has been tried; the bill does not say how it shall be used, but it has not proved a success when it has been tried before.

Nobody knows how to heat a railroad train of more than six cars by steam. The Bristol road has been experimenting with it. The method has proved a success in short trains and in warm weather. Whether in a cold snap or on a train of ten cars it will prove successful they do not know. If we are to adopt the system on the Boston & Albany road, by heating from steam from the engine, it must be considered that their experience is in heating trains of not more than six cars. To heat from zero to 70 degrees takes about 1 hour 20 minutes. As soon as the engine is detached the cars cool; and that cannot be called a success.

This act, like others passed, is either one of two things; either it is perfectly unnecessary or absolutely mischievous. The railroads have the absolute responsibility of injury to passengers in the train. We railroad lawyers, said Mr. Green, know that it is a terrible one. We don't ask to be relieved of this; but we do ask to be allowed to use our judgment in meeting it.

The Boston & Albany estimates the cost of heating cars by stoves at $50 a year; the Old Colony at $35 or $40; the Providence, Warren & Bristol cannot do it with less than four or five tons of coal a year apiece. Mr. Stone says that he does not see that the steam costs anything, and sees no reduction of pressure on the engine. By this we have the means of heating the cars cleanly and saving $40 a year for each one. He asked if it was supposed any legislation was necessary to compel them to adopt such measures? Various ones are on trial, but not one which they are ready to say they can adopt permanently. He asked that the railroads be left to the impulses of safety and economy to adopt them, as soon as a practical way was seen of putting them into operation. The experiments entered into by the roads were all entered into before the Central Vermont accident occurred, and they had not been influenced by that in their experiments. This act, if passed, would add two or three chapters more to the idiocy scattered through the Statute book. The proof usually quoted in support of steam heating is the elevated roads in New York, where the trains are small, and are always made up. Our railroads have all the time seventy or eighty cars lying at the side tracks over night which have to be made up, and made up warm. This he claimed was no criterion to go by in making requirements for railroads running long trains, and with cars that have to be left out of doors over night.

Mr. George Richards, Master Mechanic of the Boston & Providence Railroad, said that he had been recently to Maine and observed the operations of the Sewall heater upon the Maine Central road. There were four cars in the train on which he was, and a fourth car was taken on cold. The inventor of the heating system had charge of the warming of the train, and told him that it required one minute to a degree in raising the temperature of a car. The four cars of the original train were comfortably warm, but the added car was not warmed while he was present. Mr. Sewall thought it was possible to heat a train of ten cars, but had never accomplished it, and was not quite sure of it. There is no instance of a long, heavy train attached to a hard-worked locomotive having been heated by steam. The possibilities of steam-heating are unknown. The problems yet to be solved require much time and involve considerable expense, and too short a time is allowed by this bill for equipping the cars with any system determined upon. I have never seen, said Mr. Richards, surplus steam upon a hard-worked locomotive for more than a few minutes at a time. To double the speed of a train requires four times the power and four times the fuel. The steam used in keeping warm a heated train would be very small, but if it is required to warm a train quickly, say in fifteen minutes, it would make a very heavy draft upon the boiler. The Boston and Albany steam-heated train is a light train. It runs from Boston to Worcester in three hours and fifteen minutes and the same engine is capable of taking the train in two hours and forty minutes. Few locomotives now running out of Boston are hard worked, though the one hour train on the Boston & Providence road is a heavy train and is run up to about the full capacity of the locomotive. A larger boiler and a heavier locomotive means heavier rails or more broken ones.

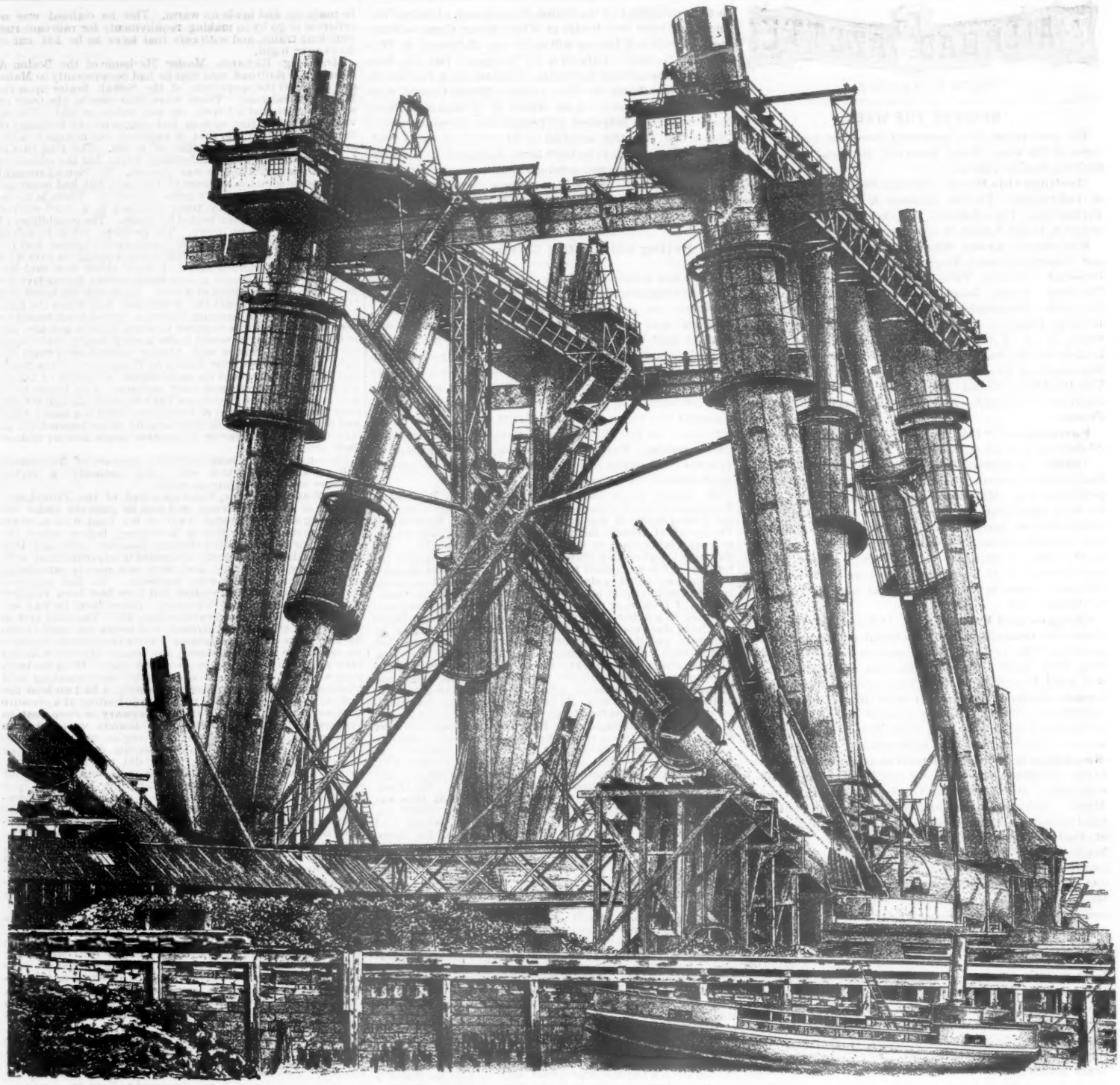
The rupture of a steampipe with a pressure of five pounds will release steam which will scald instantly; a higher pressure would not injure as much.

Mr. Waterman Stone, Superintendent of the Providence, Warren & Bristol Railroad, said that he gave the order for equipping an experimental train on his road with a steam heating system on the 25th of November, before either the Republic or the Woodstock Bridge disasters, and said that the railroads were earnestly interested in experimenting with better systems of heating, and were not merely stimulated into endeavor by the recent accidents. He had equipped three cars with the Gold system, but they had been running only since the middle of February. Since then he had encountered no lower temperatures than 18°. The Gold system stores the heat, and, it is claimed, will keep a car comfortable for two hours by the heat stored. After the cars are warmed we cannot see that we are using any steam. At zero it should take about fifteen minutes to warm cars. With the thermometer at 18°, with cars which have been standing cold from Saturday night to Monday morning, a half an hour has sufficed to warm them. We use steam in heating at a pressure of more than ten pounds. It was necessary to store heat in his cars, as cars equipped with other heaters were taken on at Warren and placed between the engine and the steam-heated cars. In reference to the section dictating gas or electricity as illuminants, Mr. Stone did not think the committee appreciated how little danger there was from the oil now in use. The oil is known as 300° fire test, that is, it must be heated to that extent before it gives off any inflammable vapors. I have thoroughly saturated a package of waste with this oil, and when it was well ablaze have thrown it into a bucket of the oil. There was no increase of the flame. The waste burned just as a wick would if saturated with the oil, and when the oil had been about half burned up, I pushed the flaming waste down into the oil with a stick and extinguished it. Oil spilled over a car will increase its inflammability, but so does varnish, and you might as well say we shall not varnish our cars. The Master Car-Builders' Association has conducted a number of experiments proving the safety of this oil.

The Julien system of electric lighting, used on the Boston & Albany road, comprises a battery of 60 cells which cost $13 each, $793; these last two years, making the cost per year $396.50. There are twenty-four lamps at $2 each, $48; renewable every two months; per year this amounts to $288. Charging costs 75 cents per day, per year of 365 days, which they estimate will be necessary, $273.75; annual cost $958.25.

Mr. A. A. Folsom, Superintendent of the Boston & Providence Railroad, said there never will be absolute safety until fires are banished from the cars. Electric lighting is in its infancy. Two years ago he allowed a car to be fitted up by an enthusiastic inventor, who proposed to light the car by an ordinary battery. He told the inventor he did not care to look at it until it had been running three months successfully. It ran only a fortnight and then the inventor disappeared, but not before he had endeavored to form a company with five millions of capital. An experiment on the Pennsylvania road with a storage battery was also a dead failure. He is satisfied that cars can be heated by steam from the locomotive only to a limited extent. Some of the railroads out of Boston run trains of ten to twelve cars. It would be a very economical thing if we could heat from the locomotives. We find that passengers want to be kept very warm, and we must keep them as hot with steam, if it is adopted, as they have been kept with stoves.

Charles F. Choate, President of the Old Colony Railroad Company, said of the 500 miles of road his corporation had only fifteen to seventeen miles of track in this state. His trains ran to Newport and reached Providence from two different directions. If a bill of the character proposed should be passed the old Colony Company will be affected to an extent vastly greater than its traffic within this state. His company had 300 passenger cars. If the system of heating determined upon as obligatory in Rhode Island should not be the same as required or permitted in Massachusetts, difficulty will arise in reconsidering them. Railway companies generally have devoted much attention to the proper heating of railway cars, but the red-hot stove, to which the chairman referred, is the rare exception. Heaters are now used. Two hundred and forty or fifty of the Old Colony passenger cars are equipped with the Johnson heater. This is a perfect heater by a system of coils and circulation of hot water. The fire is surrounded by a water jacket, and the theory is that if the heater should be broken in an accident the water would extinguish the fire. This heater would be ruled out under this bill, as it maintains a fire in the car. It is understood that a Baker heater, broken by a fall of 40 or 50 feet, fired the wreck on the Central Vermont Road. Steam heating from the locomotive is an experiment only. The Emerson system, which is quite successful, comprises also a supplementary heater under the car, and would be condemned by the provisions of this bill. The Boston & Albany experiments were quite successful, but the general manager of that road said that none of the present systems would be finally adopted. They were satisfied, however, that they would eventually heat their cars by steam from the locomotive, and are about to introduce steam heat on their two principal New York trains. None of us wish to be required to decide now which invention is the best, but experiment is necessary to



ERECTING A PIER OF THE FORTH BRIDGE.

later success. Legislation should take a form similar to that attending the introduction of the power brake. To require the equipment of cars before October is to ask an impossibility.

Lighting cars by electricity is still more an experiment than heating from the engine. It takes as long to charge the battery as it will run after being charged. It is proposed to increase this by having a succession of batteries, which may be shifted, but the batteries weigh a ton apiece. I do not think fires in cars were ever caused by the oil now used in the lamps. At the Wollaston accident on our road four cars were smashed into kindlings. Every car was fully lighted, but no fire resulted.

Experiments made in Massachusetts in dropping heaters while fired, from elevations showed that the heaters were generally not broken.

Superintendent L. M. Palmer, of the Providence Division of the New York & New England Railroad, said that the New England road had been experimenting with steam heating which they hoped might be successful, but they did not know what the result might be. They didn't regard steam heating as beyond the region of experiment by any means. As to arbitrary legislation he thought it was entirely unnecessary, as sufficient had been said to indicate that the railroads are working as fast as the conditions will warrant. They have every inducement to follow up these experiments until they arrive at successful results.

Mr. George Griggs, Master Mechanic of the Providence & Worcester, had experimented in fluid lighting, and submitted the following tests and results of tests made with mineral sperm oil, as used in lamps of passenger cars on the Providence & Worcester Railroad, March 4, 1887:

Test 1—Drop lighted lamp from same height as when in position in car striking floor and using force of throwing at arm's length. Result, lamps put out, but not broken.

Test 2—Drop lighted lamp from same height as when in position in car, striking bar of iron on floor, using force of throwing at arm's length. Result, lamp broken and put out.

Test 3—Threw large shovel of red hot hard coal among the oil, wood and car seats on floor. Result, flashed into blaze at once, setting fire to wood and car seats, which would have resulted in consuming the structure.

Test 4—Threw hand grenade among fire, striking it against wood on floor. Result, bottle did not break.

Test 5—Threw hand grenade among fire, striking it hard against side of piece representing side of car, using full force. Result, bottle broke and put out part of fire, which did not burn up again.

Test 6—Pour a lamp of oil on floor and drop lighted wick into it. Result, light put out.

Test 7—Place lighted wick in the oil. Result, wick continued to burn while oil lasted.

Test 8—Pour oil on car plush and apply lighted wicks in one minute and one-half. Result, oil on plush commenced to burn and pouring oil on the flame put it out.

Mr. Griggs added that the fluid would not take fire, unless coming in contact with live coal, which would heat the oil to the burning point of 300 degrees.

Mr. Gold and Mr. Martin explained to the committee their systems as illustrated and described in the *Railroad Gazette*, Nov. 12, 1886, and Jan. 21, 1887, respectively. Mr. Martin said that his system is now undergoing severe tests on the Chicago, Milwaukee & St. Paul, where it has been tried in a temperature 20 degrees below zero.

## The Erection of the Forth Bridge.

The accompanying illustration represents the process of erecting a pier of the Forth Bridge. The methods used are so novel, and the whole bridge is such a gigantic and ingenious structure that the methods of its construction and erection cannot fail to interest engineers. A description of the method of building the huge booms in place by riveting has already appeared in our columns,* but at the date of our visit in October last, the great tubes were only a few feet above the masonry of the piers. We are indebted to the London *Engineer* for our illustration and the following description:

Through the courtesy of the engineers, Messrs. Sir John Fowler and Mr. Benjamin Baker, we are enabled to place before our readers a view of the great cantilever pier superstructure at North Queensferry, as it appeared in the beginning of December last. Since that date a good deal of progress in the vertical columns has been made, and the great 12 ft. steel tubes now seem to grow magically. At the end of last November the highest part of the structure shown in our illustration was 171 ft. above Ordnance datum, and although the Christmas holidays and many weeks severe frost have intervened, this height is now 234 ft.,* so that the hardiness of the North British men cannot be much less than in days gone by. If they can work 200 ft. up in the piercing elements of the stormy Forth they can stand anything. The men are provided with thick flannel jackets, but even this will not keep the biting and freezing grip of the weather from face and hands. There must be no shivering and uncertain movements up on those small and often slippery footings, 200 ft. above the turbulent estuary, for in most places there is nothing between them and its rushing waters, and the individual who slips completes his history. In spite, however, of the risks run accidents are few, and the number of men employed large, at the present time about 3,500.

From the engraving which we publish this week some idea of the method of erection will be gathered without explanation, but we may refer to *The Engineer* of the 9th and 16th of October, 1885, for a complete description, with engravings, of the method of erecting these monster tubular and trussed girder structures. It will be seen that the erecting stages are put into place and bolted temporarily until reached by the riveters.

The erection of the superstructure is now in active operation on all the main piers, large additions to the plant for that purpose continue to be made, and consist chiefly of compressors, accumulators and rams for high-pressure riveting, and machines for riveting 8-ft. and 12-ft. tubes. Steam cranes, steam winches, hydraulic rams, and other appliances of a similar kind also grow in number.

On the South Queensferry main piers the four skewbacks, together with the horizontal tubes and bracing girders connecting them, are practically complete; a small proportion of the special riveting inside the skewbacks has yet to be executed, and a few plates have to be added outside at the foot of the vertical columns. The curved bottom member at the northwest pier is bolted up and partly riveted for a length of 40 ft., and those on the other piers for a length of 20 ft. The

* See "A Visit to the Forth Bridge," *Railroad Gazette*, Nov. 26, 1886.

* Within 44 ft. of the height of the steeple of Trinity Church, New York.—ED. RAILROAD GAZETTE.

bracing between the vertical columns is being erected. The method of erection of the upper portion of the main and bracing columns described in October, 1885, is in operation here as well as at North Queensferry. The vertical columns have been built up to about 196 O. D.*, and the average level of the diagonal struts is about 192 above O. D. The vertical columns are riveted to the level of 148 ft., and the diagonal struts to 94 O. D. The platform is at the level of 191 O. D. Including the tubes and girders about 2,300 tons have now been riveted. The girders on the nine northern spans of the cantilever and viaduct piers have been raised to 96 above O. D. and the masonry to 92 above O. D. The foundation has been put in for the large pier at the south end of the girder viaduct. On the main piers at Inch Garvie the four skewbacks with the horizontal tubes and bracing girders are complete. The main ties supporting the horizontal tubes are being erected, and are used as columns for support of the erecting platforms. The vertical columns have been built up to a height of 108 ft., and the diagonal struts to 82 O. D. The bottom members on the north average 26 ft. in length, and on the south 28 ft. The total quantity, including tubes and girders, of riveted work complete, is about 2,500 tons. Of the main piers at North Queensferry, the riveting of the skewbacks is still proceeding, and about two-thirds of the total is executed. The erecting platforms have been raised to 220 ft. above O. D. The vertical columns have been built to the average level of 226 above O. D., and riveted to 188 ft. above O. D. The diagonal struts have been built to the level of 215 ft. above O. D., and have been riveted for an average length of 90 ft. The bottom members on the south side have been riveted for a length of 60 ft. from the skewbacks. The bracing to the vertical columns is completed to the level of rails. The total quantity of steel work riveted at North Queensferry amounts to about 2,400 tons. The cantilever pier has been raised to 128 ft., and the viaduct piers and abutment to 131 ft. above O. D. The girders now stand at 135 above O. D.

Up to the present date 448,000 cubic ft. of granite have been delivered, and 424,000 cubic ft. set. About 102,000 cubic yards of rubble masonry and concrete work have been built. In steel work the fitting of the plates and angles at the junction of crossing of the 8-ft. tubes between the vertical columns and the bracing connected with the latter is practically complete for both North and South Queensferry. The internal viaduct for the space over the piers at both North and South Queensferry has been drilled and fitted, and a commencement made with the drilling of that for Garvie. A considerable portion of the first bay of the bracing of the bottom members for the south end of cantilever at North Queensferry is drilled and fitted. In all 35,000 tons of steel have been delivered. The average number of men employed on the works has been increased to 3,250.

It will thus be seen that the whole structure is making rapid progress. At the half-yearly meeting of the company held Feb. 17, 1887, the Chairman stated that it was confidently expected that the bridge would be completed towards the middle of 1889.

On the north side the whole superstructure of the approach viaduct, 840 ft. long, weighing 1,000 tons, was raised in one piece by hydraulic power and now rests on the top of the viaduct piers.

## Remarks Upon Mr. Albert Fink's Interpretation of Section 4 of the Inter-state Law.

Mr. Fink very clearly states that these sections are to be interpreted, not by the conflicting explanations given by different members of Congress, but by "its language, and, where that is ambiguous, by keeping in mind the object for which the law was passed."

In other words, when we have followed any line of argument, based upon the ambiguous language of this bill, to its conclusion, before accepting this conclusion, we must examine it in the light of the end or object which Congress had in view in passing the law. If the conclusion should be plainly one which Congress did not have in view, our argument has ended in a "*reductio ad absurdum*," and must be faulty in its premises, or illogical in its process.

Applying this test to Mr. Fink's conclusion on Section 4, I think we are confronted with just that result. He makes of Section 4 an absolute nonentity. In his own language, in drawing his conclusions, "That section might have been omitted altogether." That conclusion alone seems to me to absolutely refute the argument leading up to it.

The final test of the real meaning of the law can only be had in a court, and before a judge and jury. It seems to me a vain hope that such a tribunal will ever accept a construction of this law which will make of it—NOTHING—a thing which "might have been omitted altogether."

And, going over the argument in detail, it seems to me that the fallacy in the premises is also obvious. It is not stated in so many words, but the entire argument proceeds upon the assumption that the author and supporters of this bill understood the results which must follow, from abolishing all lower rates upon longer hauls in the traffic of the country. The violence of such an assumption can hardly be exaggerated.

Mr. Fink reasons, "it is obvious that the enforcement of such a rule would result in great injury to the commerce of the country." But that is "obvious" only to those who are experts in the business—who know how the lower rates upon longer hauls are forced upon the railroads by circumstances beyond their control. To the average citizen, voter and legislator, the injury to result from prohibiting a less charge on the longer haul is not only not "obvious," but he absolutely refuses to be convinced of it, and he has insisted upon passing this law to put a stop to the practice.

An interpretation which would make of Section 4 a legalizing of present practices, as regards long and short hauls, instead of an effort to change them, would exactly reverse its intent.

The protestations of railroad men and experts, and their predictions of the results which must follow, have had no effect beyond inducing the proviso to Section 4, which allows the Commissioners to suspend the operation of the law in special cases. It would be an utterly superfluous provision if it were intended that the existence of competition, at the more distant point, should itself justify a lower rate. Under this interpretation of the section, it is impossible to imagine an actual case where there would be need for a Commission with power to suspend its operation. There probably never was a case of charging less for a longer haul but under constraint of competition; and I cannot conceive of any other ground upon which a Commission would or should authorize it. If the authority of a Commission is not needed to permit it under competition, it is not needed at all. The fact that a Commission is provided, proves conclusively that this tribunal alone can authorize a less charge for a longer haul under ordinary competition.

The plain English of the situation seems to me beyond doubt or question. The author and supporters of this bill have believed, and do believe, that the railroads can and will reduce their short haul rates rather than abandon their long haul rates.

And they have forced the issue upon the railroads under terrible penalties. It seems to me vain to hope to escape it by putting an interpretation upon the law which would make of it but a jumble of words meaning nothing. The "intent" of the law is a matter of public notoriety, and when it is accepted Section 4 is very clear and emphatic legislation.

It has been suggested that a prompt compliance with its requirements will be held by the country as an effort on the part of the railroads to make the law odious.

I do not see how it can be so regarded. Not to comply with it, except at the end of the law, can more justly be held to be an effort to override and defy it. In this dilemma, and in view of the severe penalties and heavy risks attendant upon any construction which cannot be maintained before a judge and jury, there seems to me but one safe course to pursue. Tariffs should be at once prepared conforming to the intent of the law as generally understood. These tariffs should be immediately submitted to the Railroad Commission, provided for in the law to meet the very emergency which we believe is upon the country. The effect of abolishing lower charges upon longer hauls should be clearly pointed out to the Commission, and their authority invoked to relieve from the operation of the act every road which applies. As soon as any one is relieved, the relief of every other one must follow, one after another, as bricks in a row knock each other down. Otherwise the Commission would be guilty of palpable and unfair discrimination between equal competitors. And unless they begin promptly, by relieving the lines in competition with Canadian lines from the operation of the section, the latter lines and the cities of Canada will take off business legitimately belonging to the United States to an extent which must speedily educate both the Commission and the people.

To this result—the education of the people—or at least of the law makers—we must come before there can be peace and mutual prosperity. It seems to me that we postpone that day by any effort to evade the issue made by Section 4.

We should refuse to run any risks of the penalties of the law, but promptly and frankly accept the situation and place the whole responsibility upon the Railroad Commission.

E. P. ALEXANDER.

SAVANNAH, GA., Feb. 22, 1887.

*O. D. signifies "Ordnance Datum," the datum used by the Ordnance Department in making government surveys. It is generally about mean tide level.

## Freight Classification and Rates—Proceedings of the Joint Committee.

The Joint Committee (Freight Department) met at the offices of the chairman, Mr. Fink, March 2, 3 and 4. Forty companies were represented, and 45 gentlemen from companies not represented in the General Committee were present.

The chairman stated that the meeting was called to consider the revision of the classification and tariffs of the Joint Committee in conformity with the Inter-state Commerce Law. At the meeting held Feb. 18, it was provided that the freight rates and classifications and the passenger fares of the railways comprising the Joint Committee be at once examined, and be revised in all respects in which they are found not to conform to the law; that a Freight Committee, a Freight Classification Committee, and a Passenger Committee be appointed to conduct the revisions, and to consider, formulate and recommend such amended rules and regulations as may be found required to secure the uniform application of the law; that it be the duty of said committees to confer with other associations within the territory of the Joint Committee, to secure uniformity in tariffs, classifications and rules.

The Classification Committee was appointed immediately after the adjournment of the last meeting and have been at work up to the present time, and are ready to report. The Freight Rate Committee was not appointed at the time, it being supposed that no action could be taken by it before the Classification Committee had made its report. After the report of the Classification Committee has been adopted, the Freight Rate Committee will be appointed. The Passenger Committee has prepared its report and will present it as soon as freight matters have been disposed of.

Another subject which will have to be acted upon before we can proceed to revise the tariffs, is the revision of percentages upon which rates from and to Mississippi River points are to be based. You are aware that the Central Traffic Association made a report in favor of putting the percentages from Mississippi River points upon a distance basis; there were four roads who dissented, and the matter was finally referred to the Trunk Line Executive Committee for decision, and they gave a hearing yesterday to the representatives of the dissenting roads. The Executive Committee will have to decide the question at once so that we can go on with making the tariffs upon the new basis, if a new basis is agreed upon.

REPORT OF THE SPECIAL CLASSIFICATION COMMITTEE.

* * * * At the first session of the Committee, it was decided that it would be necessary to use in the revision, and to consolidate, if possible,

The Official Classification of East-bound Freight,
The Official Classification of West-bound Freight,
Middle and Western States Classification,
Joint Merchandise Classification Middle States Association,

being the four principal classifications in use within the prescribed territory. It was then decided that, before proceeding with the classification, it would be absolutely necessary not only to fix the number of classes to be used, but also the rates that might be used or adopted after the classification should be completed. To this end it was decided to adopt as a working basis the existing west-bound rates, New York to Chicago, introducing an extra class between the present fourth and special. That is, 1st class, 75c.; 2d, 60c.; 3d, 45c.; 4th, 35c.; 5th, 30c.; 6th, 25c. During the first session of your Committee, it seemed as though it would be almost impossible to reconcile the differences existing between the east and the west-bound classifications. An examination of the statistics showed that the first six classes of the thirteen comprised but six per cent. of the east-bound tonnage; bearing this in mind, the task became easier as we neared the end.

In revising and consolidating, we have been led to adopt the theory that to all intents and purposes the first three classes might be termed fixed classes, and the three lower ones, rates that could be changed at any time.

We have classified all articles under the six classes except cotton, live stock per car load, and dressed meats per car load. This may require for some roads special tariffs, between certain points on certain crude articles such as pig iron, rough stone, land plaster, petroleum, etc., but as a rule, the classification, as prepared, can be adopted and used, and it will be found beneficial to have every article named in a class to use between points where special tariffs are not necessary. * * *

We respectfully present to the Joint Committee the conclusion to which we have arrived:

1st. That, if the west-bound rates from the seaboard to Chicago cannot be advanced, we do not think that necessarily the rates on the three upper classes, east and west-bound, should be alike on account of the inequalities in the movement of the different classes of freight east and west-bound.

2d. The articles in the three lower classes practically representing both east and west-bound business in average proportions, we suggest that they be uniform in both directions.

We respectfully submit the following rates, or as near to them as possible, for your consideration, viz.:

New York to Chicago: 1st class, 75c.; 2d, 60c.; 3d, 45c.; 4th, 35c.; 5th, 30c.; 6th, 25c.

Chicago to New York: 1st, 85c.; 2d, 65c.; 3d, 50c.; 4th, 35c.; 5th, 30c.; 6th, 25c.

The rates on live stock per car load, dressed meats per car load, and cotton to be fixed in the usual way. * * *

This report was adopted except as to basis of rates.

SPECIAL COMMITTEE ON RATES.

A special committee being appointed on rates submitted the following report, which was adopted:

The Committee do not consider it advisable or practicable to establish as a principle that east-bound and west-bound rates shall necessarily be the same, but recommend that, under the conditions now existing, taking effect April 1, 1887, and until thereafter changed, the rates be:

New York to Chicago: 1st, 75c.; 2d, 65c.; 3d, 50c.; 4th, 35c.; 5th, 30c.; 6th, 25c., and from Chicago to New York the same.

The question of percentages from and to Mississippi River points was referred to the Trunk Line Executive Committee whose report was afterwards referred to the Executive Committee of the Central Traffic Association, Mr. Blanchard Chairman.

COMMITTEES ON EAST AND WEST-BOUND TARIFFS.

The report of this latter committee was submitted as follows:

* * * SEC. 1. The first question considered was the rates on export traffic *via* Boston and other points, and the following is the recommendation of the committee, with one dissenting vote:

That established tariff rates from western points of origin to eastern points of export shall be observed on all domestic and foreign exports, except when through arrangements exist, as contemplated by law, with connecting ocean carriers, in which events through rates and bills of lading may be issued with such connections, which yield less than the tariff rates to the eastern points of export.

SEC. 2. The second question, relating to tariff rates on high wines to seaboard cities for export, was determined by the report of the Classification Committee.

SEC. 3. The third question, relating to making and publishing rates to farther points in some cases lower than rates to nearer intermediate points, was acted upon in the following recommendation:

Where through rates are quoted by agreement to any point on any railroad, no rate be given or bill of lading issued at higher rates to any shorter intermediate points on the same line.

SEC. 4. Westward freight rates should be quoted and published and bills of lading be issued only via such railroads as shall join in rates to their intermediate points not in excess of the agreed through rates to points beyond, on and via the same railroads; otherwise, rates should be charged to and from the junctions of said railroads based on the authorized percentage scale thereto. The same rule shall apply eastwardly.

SEC. 5. The action of the Trunk Line Executive Committee, as the Standing Committee of the Joint Committee, upon Mississippi River percentages, having been referred to this committee, the following recommendation was adopted:

That rates from and to Mississippi River points be based upon the percentages recommended by the majority of the Percentage Committee and confirmed by the Standing Committee, the same to apply to all tonnage billed to or from or passing through said Mississippi River points. In case any railroad or railroads to or from the Mississippi, east thereof, declines to enter into through freight arrangements based upon said percentages, the rates of the Joint Committee according to the authorized scale to and from junction points with said railroads shall be charged on all the freight traffic exchanged with them.

SEC. 6. The next question, referring to the east-bound traffic from Pacific coast, was acted upon by the following recommendation:

Traffic in connection with the Pacific coast routes, eastwardly, may be taken at 28 per cent. of the through rate, as the proportion Chicago to the seaboard, as heretofore, with the minimum of 25 cents from Chicago to New York; *provided*, the Transcontinental lines do not charge more from any point east of the Pacific coast to any intermediate points west of the Atlantic seaboard.

SEC. 7. Rates from Ohio River points, on cotton, etc., being under consideration, the following was recommended:

When traffic is rated and contracted through from southern points on joint through arrangements with river and rail (which arrangements are filed with the Commission), the proportions of such rates eastward from the Ohio River need not necessarily be the same on both river and rail traffic. In this connection it is further recommended that cotton rates shall not hereafter include allowances for compression.

SEC. 8. Upon the subject of the classification of dressed beef and articles loaded in cars therewith, the new classification of such articles, as reported by the Classification Committee and adopted by the Joint Committee yesterday, determined that question, and no further action is required.

SEC. 9. Upon the subject of cartage charges, or the expense of equalizing deliveries and forwardings at terminal and initial points, the matter was referred to the meeting of the Central Traffic Association, to be held at Chicago on Tues-

day, March 8, so far as those questions relate to traffic in its territory, with the understanding that the Trunk Lines will take up the same question in the East.

This report was acted upon by sections. On the first section, Mr. Harriott, of the Baltimore & Ohio, and Mr. Whitmore, of the Fitchburg, voted in the negative; the former because he thought it would be impossible to maintain inland rates on export traffic, and the latter on the ground that it would restrict export traffic by Boston. Sections 2, 8 and 9 required no action, and sections 6 and 7 were unanimously adopted. The votes on the other sections not being unanimous they were referred to the Trunk Line Presidents Committee for final action.

DEMURRAGE CHARGE ON FREIGHT CARS.

The Chairman of the Special Classification Committee reported that, owing to conflicting laws of different states, and the varying circumstances affecting through and local traffic, it is in their opinion impracticable to enforce a uniform rate throughout the territory of the Joint Committee, applying to the collection from shippers of a charge for the detention of cars.

They are informed that a Special Committee appointed under a resolution of the Trunk Line Presidents has now under consideration the question of what measures are practicable for preventing the detention of freight car equipment at terminal points or while en route.

This committee recommends that under the circumstances action by the Joint Committee on the subject be deferred; and that, for the present, it be dealt with locally at different points, as occasion may require.

AT DIFFERENTIAL RATES.

The Chairman of the Classification Committee submitted the following report:

The differentials of the Chesapeake & Ohio route via. rail-and-water, on east-bound and west-bound traffic between seaboard cities and western points north of the Ohio River, including Louisville, on insured bills of lading, may be: 1st, 8c.; 2d, 6c.; 3d, 4c.; 4th, 3c.; 5th, 2c.; 6th, 2c.; cotton eastbound, 2c. below the established rates of the Joint Committee.

That the same differentials may apply on west-bound traffic via the Central Vermont route.

That the differentials of the Lake Route from Milwaukee on east-bound traffic be 6, 5, 4, 2, 2, 2, below the established all-rail rates.

That the differentials now in use to and from Philadelphia and Baltimore be continued, and that the differential on the added 6th class (west-bound) shall be 2 cents per 100 lbs. from Philadelphia, and 3 cents per 100 lbs. from Baltimore.

That the east-bound rates from western points to Boston be on 1st and 2d classes10 cents, and on all other classes, 5 cents above the rates to New York.

The committee find that no difference is made in live stock rates to New York and Boston; while rates to Boston higher than to New York are made on all classes of dead freight, including dressed hogs. The committee recommends that this question be taken up when live stock tariffs are established, with the view of securing uniformity of practice.

That the basis of rates from Western points to Albany and points taking Albany rates be made as follows:

| | |
|---|---|
| On first class | 10 cents below New York. |
| On second and third classes | 5 " " " |
| On cotton | 5 " " " |

On all other classes of dead freight and live stock, deduct from the rate to Boston 20 per cent. of the rate on the same class or article from *Chicago* to Boston; provided that the rate to Albany shall in no case exceed the rate to New York.

Under the operation of this rule, the actual difference between the rates to Albany and to New York, respectively, will be the same at all points other than Chicago, as exists at Chicago.

The committee understand that the question referred to them was the adaptation to the new classification of the various differentials now in use on the different number of classes under the present classification. They, therefore, do not commit themselves to any fixed differentials in any case, leaving them to be settled, as heretofore, by mutual agreement of parties interested.

The report of the committee was adopted.

The Special Classification Committee was continued, all questions immediately arising under the new classification to be referred to that Committee.

The meeting then took up the consideration of passenger matters, which will be reported in separate proceedings.

## The Compact Fire-Proof Baker Heater.

Mr. W. G. Baker, the well-known veteran inventor of the original Baker heater, has for some time past been engaged n making a considerable improvement on his old heater. He has now succeeded in making a heater which he claims is compact, self regulating and absolutely safe in the event of collision or derailment. These claims appear to be well founded, as our readers can judge from the following description and accompanying engravings:

In order to render the heater thoroughly safe, it is not only constructed practically wholly of wrought iron, but is inclosed in a rectangular wrought iron casing or "safe" made of plates and angle-irons riveted together. The heater inclosed in this safe is shown in fig. 1.

Fig. 2 is an external view of the heater itself, while fig. 3 shows the internal arrangement. It will be seen that the heater is not so high as the old Baker heater. It is hence termed "The Compact." This reduction in size is not accompanied by any reduction in heating surface, the new heater having a coil of 1¼-in. pipe about 30 ft. in length, while in the old heater the length was only about 16 ft. In the old heater the fire was both inside and outside the coil. The individual coils were therefore kept well apart in order to allow free communication between the coal inside and the coal outside the coils. In the new heater shown in the accompanying illustrations the fire is completely *inside* the coils. The pipes are coiled close (¼ in. apart) and a larger heating surface is obtained in a smaller space. The draft being admitted from below, the products of combustion rise from the burning fuel and pass outward between the coils, and thence to the chimney. The full value of the heating surface of the coils is thus utilized.

The casing immediately outside the coil is made of cast-iron in the trial heaters made, but in future heaters it will be made of wrought iron stamped to shape under a steam hammer. This inner casing is surrounded by mineral wool, which is again surrounded by a circular wrought-iron casing. It will thus be seen that the fire is surrounded, first, by a coil of pipes; secondly, by a wrought-iron casing; thirdly, by 2½ inches of mineral wool, an excellent non-conductor; and fourthly, by another wrought-iron casing. The "safe" or rectangular wrought-iron casing is exterior to all these coverings. The "safe" can be firmly bolted to a corner of the car, and occupies a small space, and radiates little heat.

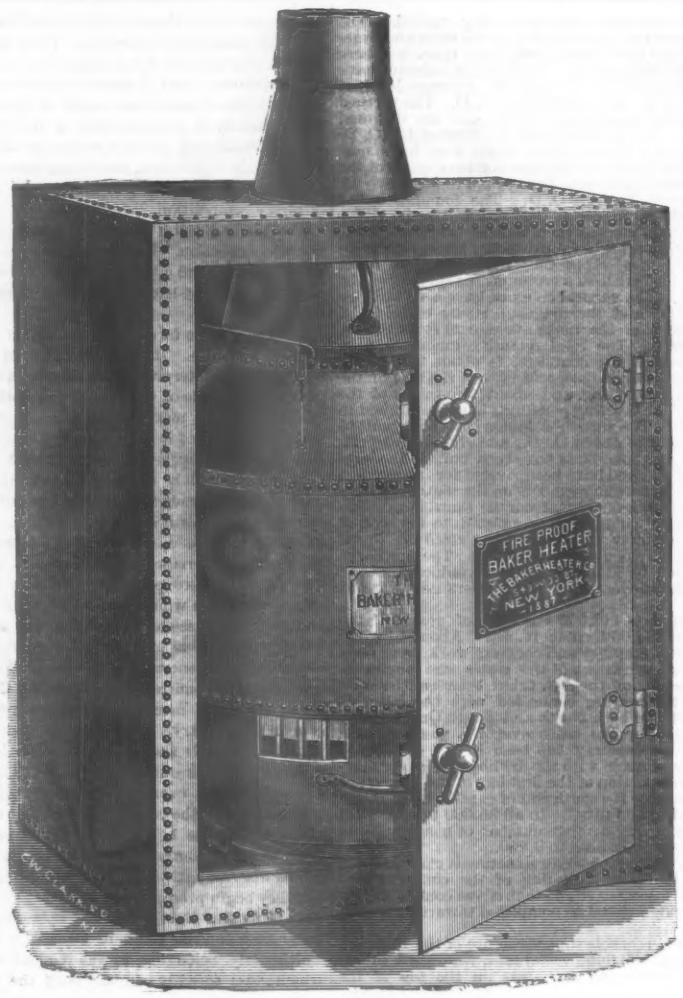



Fig. 1.—Heater Inclosed in Safe.

THE COMPACT FIRE-PROOF BAKER HEATER.

It would appear difficult for any fire to escape, even in a severe collision, unless by the doors. These, too, are carefully guarded and do not require to be used on an ordinary journey.

The coal is fed from the top, and the feeding door *U* can be firmly closed. The shield *X* is placed to prevent any coal falling between the coil and the casing. The perforated shield *V* is placed in the chimney and forms part of the wrought-iron safe referred to previously. The small holes, ⅛ in. diameter, are intended to allow the products of combustion free vent, while preventing the escape of any burning fuel, even if it should find its way between the closely coiled pipe which surrounds the fire.

The pressure of steam and consequently the temperature of the car can be regulated by an apparatus which moves a slide controlling the admission of air to the fire. The lever *I* is held down at one end by a spiral spring, and the other end supports the weight of a damper sliding vertically. This damper is shown on fig. 3, being about half open for the admission of air at *S*. The lever is pivoted about its centre, and the pressure of steam on a flat disk acts on the lever between the pivot and the spiral spring. The tension of the spring, therefore, tends to counteract the effect of the steam pressure. The latter tends to lower the damper, and, therefore, cut off the supply of air to the fire, while the spiral spring tends to lift the damper and admit a full supply of air. Consequently, when the fire is started the damper is full open. When the flat disk is pressed upward by the pressure of steam, the strength of the spring is neutralized and the damper is lowered. The spring can be hooked in any of the holes shown, thus providing an adjustment by which any desired pressure of steam can be maintained.

The advantages of this arrangement are obvious. Should the car be too hot, the porter or brakeman need not, as is now the practice, throw open the door and admit air above the fuel in order to diminish the pressure, but simply shifts the spring a hole or two inwards, so that it has a smaller leverage to keep the damper open. In this manner the damper is shut until the pressure of the steam is diminished, when the spring is sufficient to keep the damper a little way open and so maintain the lower pressure of steam. On the other hand, should the weather grow colder, and a higher pressure be desirable, the spring is shifted outwards, and keeps the damper full open until the desired higher pressure is reached.

When the damper drops to the lowest position, air is admitted outside the coil to the chimney, thus diminishing the draft.

The disks actuated by the pressure of steam are of steel, plated internally with copper. They are thus not liable to corrosion from salt water, and having no valves or working parts cannot get out of order.

It will be seen that Mr. Baker's last improvement embodies no untried devices, but is essentially a combination of various features that have been well tested.

The arrangement of the coils in the body of the car and the method of securing the circulation of the water differs in no essential respect from the ordinary Baker heater.

The water returning from the car enters the coil by the lower pipe shown and returns again on its journey round the car by the higher pipe. The higher pipe has a connection (not shown in the drawing) immediately outside the heater, with a tank or reservoir placed near the roof either inside or outside the car. This reservoir is made to resist considerable pressure, and is fitted with a filling valve and with a safety valve. The latter has no working parts, even the rubber ball formerly used being found to be objectionable with salt water. Part of the reservoir is turned thin, so as to burst with any undue pressure and thus form a safety valve.

The tank or reservoir can be provided with an ordinary gauge glass, or a couple of gauge cocks can be fitted, the latter being generally considered the preferable arrangement. A fresh supply of water should of course be placed in the tank when the water level is lowered by leakage. In the old arrangement, the steam blown off at the safety valve lowered the water level, but as will be seen, the present style of safety valve cannot leak, and only acts once and then in a very emphatic manner.

Mr. Baker claims that in ordinary cool weather, this heater will not require a fresh supply of coal between New York and Chicago. About 75 lbs. of hard coal can be placed in the heater, and if it is filled up at starting, and the fire is then well alight, the doors need not be opened for 24 hours. In exceptionally cold weather, some fire would be needed at an intermediate point.

It is obvious that if such a claim can be fully substantiated in ordinary practice, that the danger of fire being thrown from a door left open in a collision is reduced to a minimum.

## Discrimination Against Private Cars.

In a communication to the New York *Sun*, Mr. Geo. D. Burton, Treasurer of the Burton Stock Car Co., complains of unjust discrimination against the cars of his company by the Lake Shore & Michigan Southern. The substance of his communication is as follows:

The Lake Shore & Michigan Southern Railway Co., whose acting President and General Manager is Mr. John Newell, declines to recognize the rights of shippers, by refusing to receive cars of the Burton Stock Car Co. when loaded with live-stock and delivered to its road by connecting roads for any point, and the proof is in the following circular to agents:

"Hereafter do not receive any empty Burton stock cars to be loaded on our road. Do not receive any of said cars loaded, to go forward on our road, without consent of the Burton Car Co. that they be taken free of any charge against this company for mileage. A. G. AMSDEN, Superintendent."

It is alleged that while the Lake Shore & Michigan South-

Fig. 2.—Exterior of Heater.

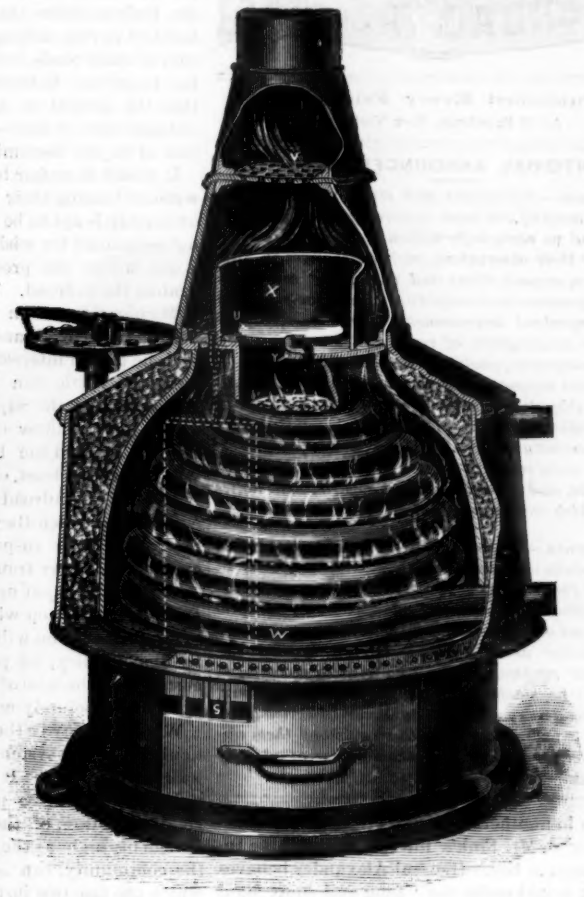



Fig. 3.—Interior of Heater.

THE COMPACT FIRE-PROOF BAKER HEATER.

ern claims that it pays no mileage earned by foreign cars while on its line, it does, in fact, pay mileage on the cars of other roads, and on the refrigerator cars of private owners, refusing to pay on the Burton cars. Feb. 5 a Burton car (No. 86) was loaded at Walworth, N. Y., consigned to Portland, Oregon. The same day the Burton Co. received a dispatch from the shipper stating that car 86 was delayed at Buffalo because the L. S. & M. S. refused to ship unless Burton released the mileage; and a few minutes later a dispatch from the agent of the railroad giving the same reason for refusing to accept the car. The agent was informed that in this case the claim for mileage would be waived. Mr. Burton finds the nigger in the fence in this item of news published Feb 16: "At a meeting of the Board of Directors of the Union Stock Yards & Transit Co. held recently in the office of John Newell, President of the Lake Shore & Michigan Southern Railroad, officers were elected for the ensuing year, with a Board of Executive Committee composed of the following gentlemen: N. Thayer, J. B. Sherman, John Newell, Marvin Hughitt, and J. H. Porter," and says that the election of Mr. Newell, President of the L. S. & M. S. Railway, to a place on the Executive Board conveys the impression that he is an owner, and as one of the Executive Committee of the Union Stock Yards & Transit Co. of Chicago, it is quite consistent that he should oppose the use of improved stock cars in which cattle can be carried with comfort to themselves and be fed and watered in transit, for the reason that it would lessen the revenue of the Union Stock Yards & Transit Co., and, of course, decrease Mr. Newell's individual income. The shipper, instead of being compelled to unload at the stock yards for feed and water, should be permitted to transport his stock at fair rates in improved cars; and with the proper facilities extended to him and just recognition from the railroads, he could take his cattle up at the grazing grounds and carry them past the Chicago yards and dispose of them at Eastern markets on a paying basis. In conclusion, he expresses the belief that a new era has dawned for the shippers, the public and the owners of improved cars.

## Express Locomotive, Lake Shore & Michigan Southern Railroad.

The accompanying illustration (*facing page* 162) represents one of three very fine locomotives that have been for several months hauling express trains on the Lake Shore & Michigan Southern Railroad. These engines were built by the Schenectady Locomotive Works, Schenectady, N. Y., from the designs of Mr. G. W. Stevens, Superintendent of Motive Power.

The engine is chiefly remarkable for the high pressure of steam carried, 180 lbs. per sq. in. Mr. Stevens informs us that the engines have done remarkably well, and that no trouble has been experienced from the high pressure.

The usual train consists of seven cars with six-wheeled trucks, but on special occasions this engine has run to time with a train of fifteen cars, nine of which had six-wheeled trucks. The Limited Express, the fastest on the road, runs from Buffalo to Chicago in 14 hours, 5 minutes, stopping at six intermediate stations. The St. Louis Express runs in 16 hours stopping at fifteen intermediate stations. The three other through express trains run from Buffalo to Chicago in 19 hours 10 min.; 20 hours 5 min; and 23 hours 40 min., respectively, the latter train stopping 2 hours 30 min. at Toledo. The distance by the main line is 540 miles, but as some of the trains run over the Air line or other cut-offs which shorten the distance, it is not possible to give the exact average speed. The Limited, however, attains a speed of about 38 miles per hour including stops.

The engine has a deep rectangular fire-box 68 in. long for burning bituminous coal. No fire-brick arch is used. The stays are 1 in. diameter, pitched not exceeding 4 in. apart. The two top rows are hollow. The fire-box crown is stayed with girder stays 4¾ in. deep, the crown being arched 1½ in. The fire-box casing is of the wagon top type. A diamond stack is used.

The side rods are of **I** section, with bushed ends. The main crank pin bearings are 4½ in. diameter by 5 in. wide, and the coupling rod bearings are 3¼ in. diameter by 4 in. wide.

Allen Richardson balanced slide valves are used.

The driving-wheels are 69 in. diameter on tread. The engine truck wheels are 33 in. diameter and the tender truck wheels 36 in. diameter on tread, Allen paper wheels, steel tired, being used in both cases.

The tender tank holds 3,100 gallons.

The main dimensions of the engine are as follows:

| | |
|---|---|
| Cylinders, diameter and stroke | 18×24 |
| Heating surface: | |
| Flues | 1,400 sq. ft. |
| Fire-box | 140 " " |
| Total | 1,540 " " |
| Driving-wheel base | 9 ft. 0 in. |
| Total " " | 23 " 10 " |
| Weight in working order: | |
| Drivers | 64,000 lbs. |
| Truck | 30,000 " |
| Total | 94,000 " |

## Proportions of Locomotive Cylinders.

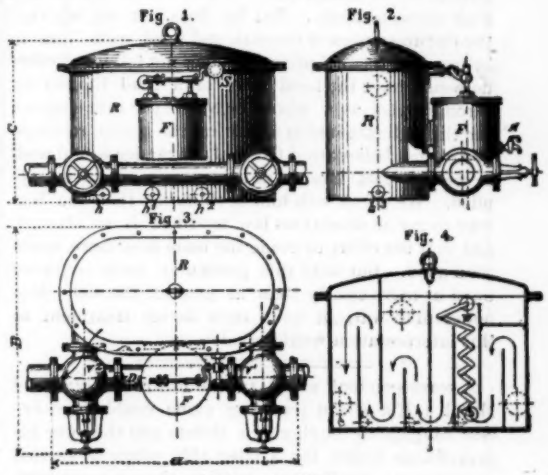
A committee of the Master Mechanics' Association have just issued a circular on the Proportion of Locomotive Cylinders. Questions are asked as to the rules used in proportioning the cylinders of passenger, freight and switching engines respectively, having regard to the diameter of drivers, adhesive weight and boiler pressure. The committee also ask whether the power is calculated on the diameter of tires when new or half worn, and what percentage of boiler pressure is assumed as the average boiler pressure. The following question is, perhaps, the most important, and the replies should prove very interesting, and will probably lead to an interesting discussion at the next annual convention, to be held at St. Paul or Minneapolis in June next:

"5. Does your experience indicate that engines in which the ratio of weight on drivers to tractive power is much below the average give better or worse results in work done, and in the economical performance of same, than engines of same tractive power, and in which the ratio between weight on drivers and tractive power is above the average? Is the life of tires longer in one case than the other?"

All replies should be addressed to Mr. Charles Blackwell, care Union Pacific Railroad, Omaha.

## Feed Water Purifier.

We illustrate herewith a feed water purifier invented by the Howaldt Bros. in Kiel, of which the original cuts and description appeared in *Glaser's Annalen*. The purification simply consists in passing the water slowly through a closed vessel in which the air rising from the water is taken off by a float blow-off valve; the mud is deposited at the bottom owing to the reduction of velocity, and the fatty matters are either tapped off directly by a foam valve at *S*, fig. 1, or liquefied by the hot worm *W*, fig. 4, and allowed to accumulate in the grease pot *F*, fig. 1. The apparatus is arranged on




Feed Water Purifier.

a by-pass between the double seat valves *V* and $V_2$, so that it can be cut out at any time for inspection, leaving the feed water direct access to the boiler.

The apparatus has been for some time successfully in use on several large steamers, and is especially useful where very high pressure steam is used.

## Oscillating Yacht Engines.

Oscillating engines were at one time largely employed in England for paddle wheel steamers, but have not been used at all in this country until within the last two years. The Jonson Foundry and Machine Co., of New York, have, however, lately built an oscillating engine with slide valve and link motion, surface condensing, for use on a small steam yacht fitted with a screw propeller.

A single cylinder is used, 8 in. diameter and 9 in. stroke, running about 200 revolutions. The engine is expected to develop about 32 I. H. P. when working with 100 to 120 lbs. boiler pressure. The propeller is 45 in. diameter and 6 ft. pitch. The boiler is of the upright tubular type, with steam drum and superheater. It is 54 in. diameter, 6 ft. high, with 200 tubes 2 in. diameter and 4 ft. long. The shell is made of ⅝ in. plates of Lukens steel, which, when tested, gave a breaking strain of 69,706 lbs. per sq. in., with .56 reduction of axle. The pressure allowed is 180 lbs., but only 120 lbs. will be carried.

The yacht is of the following dimensions:

| | |
|---|---|
| Length over all | 60 ft. 0 in. |
| " on water line | 53 " 6 " |
| Beam | 11 " 6 " |
| Draft of water | 4 " 8 " |

The estimated speed in smooth water is about 12 miles per hour.

RAILROAD GAZETTE

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At 73 Broadway, New York.

## EDITORIAL ANNOUNCEMENTS.

**Contributions.**—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

**Advertisements.**—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

We publish in another column a criticism by General Alexander on Mr. Fink's interpretation of the Inter-state Commerce Bill. General Alexander believes that Mr. Fink would make the "long and short haul clause" almost unmeaning; that the courts will quite certainly interpret it more strictly than that; and that the best, and in the end the safest, way for the railroads is to conform strictly to its apparent requirements, in order that the public may see how bad the bill is and change it as soon as possible. We do not know just how far he proposes to go in this matter. He says, rightly enough in our judgment, that the bare fact of competition does not constitute a "difference of circumstances" to the extent which Mr. Fink seems to imply. But he does not say whether the circumstances of through and local traffic are to be regarded as dissimilar. He does not tell us whether he would have the local rates of a road limited by through rates as a whole, or by the pro rata share of the through rate which a link in the route receives. We cannot believe that General Alexander would wish to see this last interpretation even temporarily applied. We agree with him in thinking that the best way to get an obnoxious law modified is to obey it, and that the effort to evade the issue does more harm than good. But until this particular issue is forced upon us more clearly than at present, the case does not seem to warrant quite such heroic treatment as this interpretation would involve.

A correspondent asked in the *Railroad Gazette* of March 4, if a person traveling alone could check excess baggage by buying two tickets and then use his superfluous ticket for a later ride when he carried no baggage. Really this question should never have arisen. The practice of carrying any baggage free is an anomaly and an injustice. It is unjust to the public and to the companies. It is unjust to the public, in that he who has little or no baggage must pay the same as the passenger who carries the full allowance. This is an injustice too which can never be distributed, so that the average amount of wrong done travelers will be about the same, for there are large classes who habitually travel light, and others who, from the nature of their business, always carry the full allowance. The injustice to the companies lies in the fact that they have constantly to carry what they never agree to carry and are not paid for, that is, merchandise checked as baggage.

As now is the time for correcting abuses, why not do away with this one? It would be amusing to listen to the noise made by those who have learned to believe that they have a vested right to commit fraud on the railroad companies.

In a communication to the New York *Sun*, of which we publish an abstract in another column, the treasurer of the Burton Stock Car Co. complains of the treatment received at the hands of the Lake Shore road. The railroad authorities at East Buffalo refused to make any car mileage allowance, and the shippers suffered some delay and inconvenience as a result. Mr. Burton claims that the railroad company is in the habit of paying mileage allowance, not merely on the cars of other roads, but on the refrigerator cars belonging to private individuals or corporations, and says that the refusal to allow the Burton Company the ordinary rate of three-quarters of a cent per mile, is a case of unjust discrimination.

It would be unfair to condemn the railroad company without hearing their side of the case. Private car ownership is apt to be a nuisance, and a manager may not be blamed for wishing to discourage it. But there is one fact in the present case which tells strongly against the railroad. The president of the Lake Shore & Michigan Southern road is a director in the Union Stock Yards & Transit Company of Chicago. As such he has an interest against seeing cars introduced on which cattle can be fed and watered in transit. The action of the Superintendent in instructing his agents not to allow car mileage to the Burton Stock Car Co. favored the Union Stock Yards' interest. It was, to say the least, open to suspicion.

As long as railroad directors make contracts with concerns in which they have a private interest, their motives will be suspected. The practice opens the door to so many frauds, that the worst possible construction will be put upon any transactions which may occur in connection with it. If a railroad director is so situated that he will profit personally by a particular line of policy, the public will believe that he suggested it for the sake of his own personal interest, even if he had absolutely nothing to do with it.

Whatever may be the rights and wrongs of this particular case, the system of directors' contracts is a radically wrong one. It puts a bad look upon transactions which may be perfectly innocent. Neither the good reputation of the Lake Shore road nor of its President, high as they both stand in the esteem of the community, can save them from the suspicion which the practice justly involves.

## ACCIDENTS AND LEGISLATION.

A railroad accident which kills and maims is horrible. Only a battle-field is worse, and while the suffering and waste of battle produce some fruit, a railroad accident is pure loss. No one with a spark of humanity can fail to be stirred to sympathy with the crippled survivors, with the friends of the dead, and with the responsible officials; for let it not be doubted that the officials do suffer in mind as other men do. But a few months ago we met the brilliant and successful president of a great company, shortly after a serious accident on his line, in which several lives were lost. His sorrow and misery could not be doubted. He was a grief-stricken man.

There is another result of great railroad accidents which, while it does not appeal to the feelings, must cause serious thought in every patriotic mind—that is, the sudden crop of legislation which springs up. All over the Union crude bills appear and clamor arises to compel the railroad companies, under heavy penalties, to do all sorts of impracticable things—to immediately adopt half-baked and unworkable devices; to abandon the results of costly experience for unproved theories; to do in one State what may be illegal in another. The serious public aspect of this is its indication of the growing fashion of seeking in legislation a remedy for any real or supposed ill, instead of trusting to the sense of individuals, working untrammeled, to gradually evolve that which is sound, enduring, and in the end best for all concerned. In other words, it is another form of a tendency toward socialism; another expression of the pernicious notion that "the government supports the people." Moreover, one who knows much of the inner workings of legislative bodies is obliged to look for the origin of much of this hasty legislation, not in ignorant but well-meant public spirit, but in corruption. Who can doubt that many bills are conceived merely that one interest may pay committees to suppress them, or that another interest shall pay to have them pushed? Without any reflection on the character or intelligence of our law makers, it is beyond doubt true that in every state legislature there is a greater or less number of experienced, adroit, unscrupulous "strikers," who scheme to get on committees or to control them for the money that is to be made, and who well know how to stir up and use popular excitement for their own ends. There are few great corporations that have not had painful proof of the existence and power of such statesmen. Perhaps railroad companies suffer more from their raids than other companies having equal interest at stake, and perhaps not; but the evil exists, and the public should not allow itself to be misled by artificial clamor.

What is the moral of all this for the railroad companies? When one has begun to pay black mail it is not easy to stop. On the other hand, when a rapacious brigand has got the drop it is hard not to pay ransom. The moral, however, would seem to be to defy the legislative "striker" from the start, and to trust to the discernment and gratitude of an intelligent and well served public.

## BALTIMORE & OHIO AND RICHMOND TERMINAL.

The destiny of the Richmond & West Point Terminal Railway & Warehouse Company seems to have been from the beginning to play a sensational part in the financial and railway world, and the past week has been marked by one of the theatrical surprises to which the public have become accustomed in connection with its history. Semi-official statements are made that the controlling interest in the Baltimore & Ohio Railway has been acquired in the interest of the Richmond & Terminal Company, which, if true, is an event of the first importance, and will give to the last named company a position in the railroad world which makes it of interest to recall the career of this unique corporation.

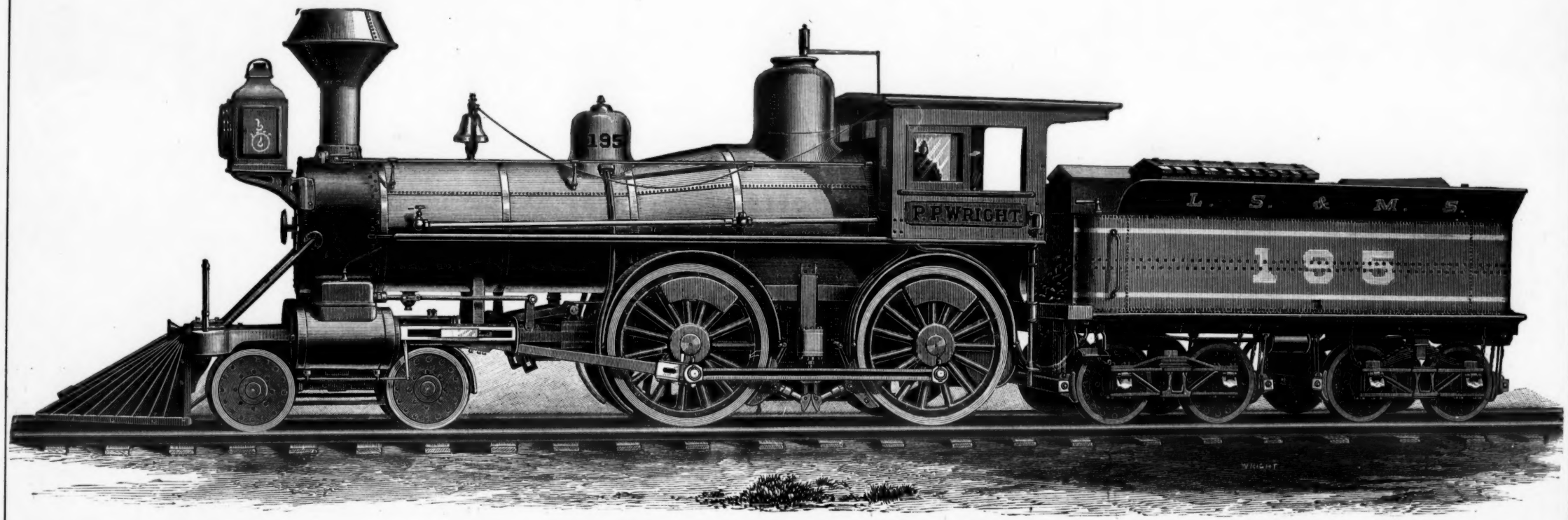
The Richmond & West Point Terminal & Warehouse Company, which is essentially an investment company, was incorporated by the state of Virginia, March 8, 1880, in the interest of the Richmond & Danville Railroad Company, to enable the former to acquire railroad and other properties which the latter, by its charter, could not directly control. The "Terminal" Company had almost unlimited powers in regard to the acquirement of railroad properties by purchase or otherwise, and it was allowed to increase its capital stock without limit, to consolidate with other companies and to change its name when desired. The Richmond & Danville Railroad Company subscribed at first to a majority of the Terminal Company stock, which in October, 1881, was fixed at the modest total of $3,000,000.

The Terminal Company speedily acquired control of various railroads in the South, by purchase of stocks and subordinate bonds, representing an aggregate mileage of 729 miles in November, 1881, when the Terminal stock was listed at the New York Stock Exchange.

From this time onward, a series of extraordinary movements began in the market quotations of the stock, and an advance was established beginning in November, 1881, at 122 per cent., and culminating in February, 1882, when the price touched 263, making an advance of 140 points in price during the brief interval of five months.

A succession of "privileges" for the purchase of securities was offered to shareholders in the Terminal Company during that interval, each of these privileges being at once salable by the favored shareholder at large premium, and the phenomenal and uninterrupted advance in the price of the parent stock seemed to open a mine of wealth to the fortunate proprietors. But having reached its climax in February, 1882, a decline in prices took place still more rapid than the advance, so that the next month the stock sold at 100, and heavy losses were inflicted upon the speculators and upon the insiders who were still holders of the stock.

From this time on, the Terminal Company continued its function of acquiring new connections, and its stock was increased on May 11, 1882, from $5,000,000 to $15,000,000. The Richmond & Danville people, all through this period, retained the proprietorship of the majority, and no marked events occurred in the history of either of the companies until April, 1886, when a new condition was established in the relations of the Terminal Company and the Danville Railroad Company, which resulted in a reversal of the control, or, as Wall street expressed it, "the tail wagged the dog." Prior to April, 1886, the Richmond & Danville Railroad Company had secured legislative authority to enable it to take direct leases of various properties which it required. Having quietly perfected such leases, it was no longer essential that the railroad company should retain any proprietorship of the securities which heretofore it had acquired through the Terminal machinery as above noted. The Terminal stock belonging to the railroad was, therefore, gradually sold in the market, and shareholders of Terminal awoke suddenly to the knowledge that their proprietorship represented little or nothing but equities in various companies heavily mortgaged, without even the control, the latter being vested in the Danville Company, which had no longer any proprietary interest in the Terminal. Much excitement ensued among the management of the Terminal Company, and suits were threatened against the Danville Railroad to endeavor to undo the work which




EXPRESS LOCOMOTIVE, LAKE SHORE & MICHIGAN SOUTHERN RAILROAD.

*Designed by* G. W. STEVENS, *Superintendent of Motive Power.* *Built by the* SCHENECTADY LOCOMOTIVE WORKS, *Schenectady, N. Y.*

the latter had accomplished. But whilst the slow machinery of the law was set in motion, the heavy capitalists interested in the Terminal Company found a quicker way of annulling the apparent divorce which had been established between the two wedded companies. By negotiation with the holders of a majority of the stock of the Richmond & Danville Railroad a purchase was effected, but at a price stated to be about $230 per share for stock which only about twelve months previously had sold at less than $50 per share. To enable payment for this purchase, new issues of capital became necessary, and in consequence the Terminal Company issued $5,000,000 of new preferred stock and $9,000,000 of new common—a heavy burden, indeed, of capitalization, but which secured irrevocably the control of the Richmond & Danville Railroad, without which the Terminal Company would be devoid of life or motive for existence.

Another restful period ensued until January, 1887, when a new surprise took place in the acquirement of control of the East Tennessee, Virginia & Georgia Railroad Company. In the latter company, under its reorganization, the voting power for a majority of the directors was vested solely in $11,000,000 of preferred stock, of which a majority was held by a few capitalists, from whom the Terminal Company had no difficulty in purchasing $6,000,000 of stock at par, the market price at the time being about 75. The occasion was seized to purchase also the remainder of the Richmond & Danville stock outstanding, $2,500,000, payable in Terminal stock at the rate of four for one.

More securities had to be issued, this time of $16,000,000 of stock and $8,500,000 of collateral trust bonds, thus rounding up the capital account of the Terminal Company to the creditable total of $40,000,000 of common stock, $5,000,000 of preferred, and $8,500,000 collateral trust bonds. These securities represent the proprietorship of various equities and subordinate securities in the Richmond Terminal Company, and Richmond & Danville Railroad systems, the majority of preferred stock and controlling vote in the directory of the East Tennessee, Virginia & Georgia Railroad, and through the latter the administration of the Memphis & Charleston Railroad.

The total mileage thus operated by the Terminal Company administration is 4,040, which may well be regarded as an important feeder to be acquired in the interest of any trunk line. If to this mileage is now to be added the Baltimore & Ohio system of 1,700 miles, the control of an aggregate of nearly 6,000 miles will be vested in a single directory, in close affiliation with whom are said to be the managers of the Philadelphia & Reading and Jersey Central Railroads, with their combined systems of about 1,600 miles. The grand total of 7,500 miles thus described reaches from New York to the Gulf of Mexico at Mobile, to the Mississippi River at Memphis, and to Chicago, and may well be described as a momentous power in its relation both to the transportation system and to the financial world.

Rumor asserts that these great powers are all to be exerted in the interests of peace and harmony among jarring administrations, whether of railroad or telegraph lines, and as experience demonstrates this, we may expect the public mind to be proportionately tranquilized and reassured in its consideration of the effect upon values of securities.

No doubt liberal issues of new capital by the Terminal Company in some form or other will again be found necessary to provide means to pay for the colossal obligations incurred in the new purchase, but as regards these the public may be trusted to take care of itself, having before it the ancient motto of *caveat emptor*.

## THE POSITION OF DRAUGHTSMEN.

A very prevalent notion as to the use and position of draughtsmen is thus expressed by a correspondent in another journal, who characterizes the average draughtsman as under :

> He occupies as distinct a place in a mechanical engineering concern as a molder, turner or erector. His essentials are the power to see through a piece of tracing paper, a knowledge of the number of eights in an inch, and such a smattering of arithmetic as will enable him to add up a column of figures correctly. He receives from the manager all the dimensions which constitute the essential features of a design, and then proceeds, by the combined aid of shrewd guesses and old drawings to make a sort of patchwork, which, after being submitted to the chief two or three times is pronounced complete, and inked in, the whole operation requiring no great mental exertion, and, in my opinion, less intelligence than is needed of an erector or a molder.

If this view were correct, one could well understand that a draughtsman is a person whose services are neither important nor indispensable, but as a matter of fact a good draughtsman can and does continually save his employers more money and time than any two of the best paid shop hands. A new job of any complexity that involves some wide departure from existing patterns and templets, should be thought out and laid down on paper, before the materials are irrevocably shaped in the shops. A mistake discovered on the drawing board can be corrected by the expenditure of a little india rubber and lead pencil, but a mistake discovered in the workshop may mean new patterns, loss of time and expensive half-finished work contributed to the scrap heap. In appearance and proportions work which has been carefully thought out in the drawing office is naturally superior to that which is set out in the shops bit by bit by men who can only at the best have a mental picture, and not a drawing in black and white of the whole machine before them, where they can ascertain at a glance the relative proportion and relation of the different parts. Many otherwise good pieces of work have been spoiled because at the last moment, in the erecting shop, it was discovered that a rod or lever fouled some important part, involving alterations at once unsightly and unmechanical.

The terms "good draughtsman" and "good drawing" have each two distinct meanings. A draughtsman who can make a very handsome drawing, nicely colored and shaded, with all the writing well executed and all the lines very smooth and even, is, in one sense of the term, a good draughtsman. Give him a rough but complete sketch, and he can make a well-executed copy. If he can do this and nothing more, he is not a good draughtsman in the highest sense of the term. A really good draughtsman is a man who can make a drawing from which a good machine can be made.

A drawing in itself is merely a piece of paper with lines and figures on it, and the fineness of the lines and the graceful appearance of the figures are merely matters of minor importance; the vital question is, what can be made from the drawing? If a cheap, durable, economical and powerful locomotive can be made from a set of drawings it matters little whether those drawings were neatly figured or whether their lines were carefully or roughly drawn. The drawings have served their purpose when they enable a good piece of work to be made.

Similarly it is not essential that a draughtsman should be able to make a drawing that may be mistaken for a copper plate engraving, but it is very necessary that he should have actually worked in the shops, and know exactly how the various operations of molding, smithing, turning, planing, riveting, brazing, etc., are conducted. With this knowledge, and a mechanical bent of mind, developed by a careful study of the elementary laws of heat and steam, and the essential principles of mechanics and dynamics, a man can hardly fail to be a valuable draughtsman, even if his fingers are not so dextrous with the pen and pencil as his compeers who have spent their whole time in the drawing office, occupied merely with the superficial art of making a neat drawing.

Many draughtsmen are, of course, equally skillful with the hammer and chisel and the drawing pen, and a neat draughtsman is generally careful and precise and not likely to fall into mistakes. In order, however, to make a first-class draughtsman, who can boldly leave the old ruts and design something new, something beyond mere neatness is requisite. Some theoretical knowledge combined with a practical acquaintance with the manipulation of materials in the shops is really essential.

The reason of this is obvious. A really good draughtsman has to endeavor to make the machine he is designing combine several conflicting excellencies. Not only should the machine be capable of doing its work well when new, but provision must be made lest the effect of wear and tear and the accumulation of dirt should disable the machine or greatly impair its efficiency after a few months or years working. The machine should also be capable of being cheaply and accurately made, without resorting to any risky or inferior methods of construction.

Many draughtsmen almost entirely ignore these three requirements. They design castings in such a manner that it is difficult to obtain sound metal or prevent the cores from shifting. The unpractical draughtsman draws smithwork with difficult welds which are very liable to become unstuck at a critical moment, and commits many other similar practical errors which lose him the respect of the shop hands.

A thorough acquaintance with shop practice is essential if mistakes of this class are to be avoided. The chief draughtsman ought to familiarize himself with the shop practice of the works with which he is connected, and it is just as well for him to walk through the different shops every day and see personally that the foremen and workmen find no difficulty in carrying out his drawings. Any suggestions they make as to alterations in the design tending to cheapen the cost or improve the quality of the work should be carefully investigated. It is always important that the drawing office and the works should be thoroughly in accord. In too many shops the drawings when made and sent into the shops are regarded as the merely ornamental efforts of a few impractical young men. The drawings are mercilessly criticised on all hands and are never worked from when a departure from the shapes or dimensions given appears possible. In others shops again the motto is "Work to the drawings when you can, when you cannot, say nothing about it." This, too, leads to great confusion. For instance, the drawing office sends out a drawing of some part of a locomotive, say a cylinder. The shops see occasion to make some alteration without informing the drawing office. Finding, when the engine comes to be erected, that things do not quite come together, some further alterations are made, but the first alteration having been made without the advice of the drawing office, the shops carefully say nothing about the fresh departure from the drawings. Bye and bye, a new style of locomotive is wanted, and the drawing office, using as many old drawings as possible, assumes that the old cylinder can be used. Matters on paper are arranged to exactly suit it, and thus avoid the expense of new patterns. The alteration made in the shops is, however, discovered at the last moment, and some further alterations are necessary in order to make a tolerable job.

Good drawings, showing clearly all the requisite dimensions, and conforming to all the practical requirements of the shops, command respect and will generally be worked to faithfully. But if numerous dimensions are omitted, and the drawing shows parts made in a needlessly expensive manner, the shop foreman and hands are sure to place their own interpretation on the drawings and suggest and carry out alterations with small regard to the opinion of the draughtsman.

The first step in securing standards in any extensive or complicated piece of work is that the drawings and the templets agree exactly. Unless this is done, the term standard is merely a delusion and a snare.

One cause of the prevalence of poor and imperfect drawings is the common notion that drawings can be made in a few hours, and that if they are not finished in short order, so much the worse for the drawings. The work must go ahead without waiting for the drawings. It is a tolerably safe rule that to make the drawings takes as long as to build the object they represent, and an extra day or week occupied by good draughtsmen in making drawings saves the same time in the shop.

A complete set of clear and fully dimensioned drawings enables the various foremen to order the materials, and get the templets made and proceed with the work simultaneously in the different shops. Where drawings are imperfect or untrustworthy the work must be delayed in order to make sure that the different parts are in accord, and will ultimately come together correctly.

A good set of drawings, on whichsome considerable time and thought have been spent, generally means a convenient and well designed result, and this is often well worth waiting for, even if the process does involve some extra time in the drawing office, as most, if not all, the time thus apparently wasted will be saved in the shops.

## SIGNALS AT CROSSINGS.

There is a story of a good old lady, whose religious convictions were decided, but whose knowledge of the technical terms of theology was not accurate. She was asked if she believed the doctrine of total depravity. "Oh, yes," she said, "it is a blessed doctrine, if people would only live up to it." Much the same might be said of the doctrine of the law as to the obligation of railroad trains to give signals at crossings, and of the relative duty of wayfarers, by wagon or on foot, to look and listen for the approach of trains; the doctrine is good if trainmen and wayfarers would only live up to it.

The foundation of this doctrine is a principle that the parties have equal rights, or more accurately, the parties have equally a right to cross. The railroad company must necessarily have the right to lay its tracks and runs its trains across the highway at the lawfully appointed places. The highway traveler has the right to walk or drive across the track at all times which do not interfere with the passage of trains. This right seems feeble and trivial in the view of an individual traveler; as he approaches the crossing he feels as he were about to cross on sufferance; but viewed in reference to the general public, it is substantial and important. Thus a railroad company can

prescribe a rule forbidding pedestrians to walk alongside the track from one station to another, but it cannot forbid a pedestrian to walk upon the highway where there is a crossing. In a sense, each party has a right to use the square of ground where the track overlays the road, for the purpose of passage, so that the general right of passage is not forbidden to the other. The law recognizes this right. Authority from the Legislature must be obtained to entitle a company to invade the highway with its tracks. Ordinarily, this authority is coupled with some express condition that the company shall construct suitable crossings and keep them in suitable condition; and this means a condition suitable not only for the trains, but also for a highway. Surveyors, contractors, inspectors, laborers, all in fact who have to do with the construction or care of the railroad at the crossings, will do well to bear in mind that they must make the crossings safe, and keep them safe, for the public as well as for the company. Thus, if there is a planking which is neglected and becomes loosened or separated, so that a wagoner's horse catches its hoof and is held fast until a train passes which kills it, the company may be charged in damages, because the planking was not safe for the wagoner and his horse, although the defect was entirely unimportant to the passage of trains. In short, the company acquires its right to use the highway on the condition that it shall not destroy the public use. The right of the public to the road is in a general sense superior to the right of the company to lay tracks. This is illustrated by the case lately decided against the Delaware, Lackawanna & Western Railroad Co. The charter gave the company general right to cross highways, but required it to keep the highway at the crossings fit for safe and convenient use. The company laid one track after another across Spring street, in Newark, until at length there were nine. The Court was then asked to enjoin them from maintaining so many. The Court said that for the railroad to make such a use of a city's street practically destroyed it as a highway; "that the right to lay tracks across streets must always and under every condition of circumstances be exercised in subordination to the rights of the public, and in such manner as shall not destroy the street," and the company was compelled to tear up four of its tracks.

No less important is the duty imposed by law on the trainmen—the engineers and flagmen chiefly—of giving notice by signals that a train is approaching a crossing. In several of the states a statute prescribes the signal; orders the ringing of a bell or the sounding of a whistle. If there is no statute, then the courts require reasonable signals under the circumstances to be given. A peremptory statute sometimes renders the engineer's duty difficult, for the legislators fail to make any arrangments for communicating the meaning of the signals to timid or spirited horses. In practice then the signal becomes nearly as dangerous as the train. What shall an engineer do when the Legislature says, "Positively you must blow your whistle," and the courts say, "If you scare a horse with your whistle you must pay damages?"

This difficulty is illustrated by Miss Hogeland's suit against the Philadelphia, Wilmington & Baltimore Railroad Co., finally decided last September. Her brother-in-law invited her to take a wagon ride with him, in the course of which they came to a crossing. He carefully looked and listened, so he testified, for any coming train, and neither saw any nor heard any signal. The wagon was driven toward the track, which was an unusually dangerous one—for one reason because the wagon must necessarily run a short distance alongside the track before the point of actual crossing was reached. Just as it completed this part, and was about to turn upon the track, to cross, a train came up from behind, running at the rate of about forty or fifty miles an hour, and the engine, on a sudden, gave a loud whistle. This startled the horse, with the effect that he sheered toward the track, broke from the control of the driver, and brought the wagon into collision with the train, whereby the lady was badly hurt.

As very often happens, the witnesses conflicted on the question whether the whistle was blown when it ought to have been, a few seconds before the train reached the crossing; but there was no dispute that a sharp whistle was given at the critical moment.

The Court explained the general law of the duty of engineers in respect to blowing the whistle in these words:

"The evidence shows that the crossing was one of more than ordinary danger, and therefore required the exercise of more than ordinary care, both on the part of the parties at tempting to cross the tracks of the railroad and of the managers of the passing trains. The duty is mutual and reciprocal, and not confined to one party only. The railroad trains, from the nature of things, have the precedence of passing the crossings of public ways unobstructed; but it is the duty of those directing the trains to be careful to give all proper and sufficient signals of their approach, and to take all reasonable precaution, in view of the nature of the crossings, to avoid collision."

The jury were told that unless they found that the injured lady was chargeable with some personal neglect of proper precautions in attempting to cross, the company was liable in damages. If they thought the engineer careless in blowing the whistle, at the moment when he did, the company was liable.

The rule alluded to in this last case, that the highway traveler must look and listen for the approach of trains, has gradually become well settled, and among courts and lawyers is now generally understood. The lawsuits during the past few years have taken the rule for granted, and have confined themselves to discussing whether, in the particular case, the plaintiff looked and listened sufficiently.

In a suit against the Lehigh Valley R. R. Co., the witnesses, as usual, disputed whether the train was running too fast, whether the bell and whistle were properly sounded, etc, etc. The Court said that the corporation had a perfect right to run its trains across the highway, and the sleigh had a perfect right to cross the track, and that each of them was held by law to co-relative duties of care and prudence. In respect to the question whether proper care was exercised by the highway traveler, he testified that, when within twenty feet of the track, as the road in the neighborhood of the crossing was very much obscured by trees, buildings or something of that sort, he had his driver stop the sleigh and he himself walked down upon the track, and looked and listened in both directions; then, not seeing or hearing any train, he returned to the sleigh, took his seat and was driven to the track, but at the moment of crossing the sleigh was struck by an approaching train and the driver and horses killed. The Court said that if the jury believed these were the circumstances, the plaintiff exercised reasonable diligence in looking and listening.

## The Illinois Central.

The report of the Illinois Central Railroad Co. for 1886 shows that its prosperity continues and that the investing public has unabated confidence in the value of the property and the ability of its management, as indicated by the market taking $5,000,000 of bonds bearing the low rate of 3½ per cent. interest, and $1,000,000 of stock at $136 (par $100), during the last year. It must be borne in mind, however, that this company has had since its inception a large income from land donated by the Federal Government, which is about to cease, as only 152,959.43 acres remain unsold. The net amount received from this source during 1886 was $102,120.69.

This company has 952.99 miles of road in Illinois, 793.92 south of Cairo, extending to New Orleans, and 402.16 miles in Iowa, making a total of 2,149.07. The total miles of track are 2,600.59, of which 1,903.93 are in steel. The average miles operated during the year was 2,089.39, against 2,066.35 in the preceding year.

The general account condensed and compared with 1885 stands as follows:

| *Assets.* | 1886 | 1885 | | Differences. |
|---|---|---|---|---|
| Lines owned | $70,866,313 | $67,280,914 | I. | $3,585,399 |
| Iowa leased lines | 1,482,968 | 1,391,858 | I. | 91,110 |
| Supplies on hand | 549,898 | 484,685 | I. | 65,213 |
| Insurance fund | 65,649 | 24 307 | I. | 41,342 |
| Net assets, New York | 9,196,756 | 4,146,658 | I. | 5,050,098 |
| " " Chicago | 144,538 | 251,257 | D. | 86,719 |
| Total | $82,306,122 | $73,559,679 | I. | $8,746,443 |
| *Liabilities.* | | | | |
| Capital stock | $29,000,000 | $29,000 000 | | |
| Funded debt | 18,971,000 | 10,036,000 | I. | $8,935,000 |
| Capital stock Chic., St. L. & New Orleans | 10,000,000 | 10,000,000 | | |
| Funded debt | 18,000,000 | 18,000,000 | | |
| March dividend | 1,015,000 | 1,160.000 | D. | 145,000 |
| Surplus dividend fund | 302,742 | 294,190 | I. | 8,592 |
| Insurance fund | 65,649 | 24 307 | I. | 41,342 |
| Total | $77,354,431 | $68 514.497 | I. | $8,839 934 |
| Surplus | 4 951,691 | 5,045,182 | D. | 93,491 |
| Total | $82,306,122 | $73,559,679 | | $8,746,443 |

From the foregoing table it appears that the assets have been increased in the sum of $8,746,443, covered by an increase in liabilities of a similar amount less $145,000 decrease in March dividend and $93,491 in the surplus, the funded debt alone being increased $8,935,000. These figures, however, are misleading, since $5,000,000 five per cent. bonds of the Chicago, St. Louis & New Orleans Railroad Co. are pledged to secure £1,000,000 Illinois Central Railroad Co. 3½ per cent sterling bonds of 1950, and are included in the New York assets, and also in the funded debt. Under the circumstances, both sets of bonds cannot justly be considered as liabilities, and as those of the Chicago, St. Louis & New Orleans Railroad Co. are not on the market, for the purpose of this comparison, and that the public may properly understand the situation, we eliminate them from the account on both sides, thus showing that the real increase in the assets is $5,000,000 less ($3,746,443), as is also the case with the funded debt, which is increased only $3,935,000.

The principal portion of the $8,746,443 was expended in construction and betterments and charged to capital account, as will be seen from the following:

| Expended on— | |
|---|---|
| Chicago, Madison & Northern Railroad | $745,000 |
| South Chicago Railroad | 7,138 |
| Yazoo & Mississippi Valley Railroad | 1,108,750 |
| Chicago, Havana & Western Railroad | 1,367,882 |
| Rantoul Railroad | 356,629 |
| Total on owned lines | $3,585,399 |
| Iowa Division | 91,110 |
| Total | $3,676,509 |

The proceeds realized from the sale of the $1,000,000 of stock have been credited to an "Improvement Fund" against which will be charged 1,000 new freight cars, two elevators at Chicago and the equipment of branch lines.

The following figures show the gross earnings for eight years:

| Year. | Illinois lines. | Iowa lines. | Southern Division. | Total. |
|---|---|---|---|---|
| 1879 | 5,711,282 | 1,523.182 | 3,357,305 | 10.591,769 |
| 1880 | 6,529,324 | 1,775,487 | 3,716,902 | 12.021,713 |
| 1881 | 6,734.954 | 1,852,443 | 4,059,151 | 12,645,548 |
| 1882 | 6,959,780 | 1,945,532 | 3,848,537 | 12.753,849 |
| 1883 | 6,674.703 | 2,025,110 | 4.364,930 | 13,064,743 |
| 1884 | 6,158.312 | 1.712,399 | 4,320,181 | 12,190.833 |
| 1885 | 6.508,112 | 1,678 336 | 4,434,816 | 12,621,264 |
| 1886 | 6,707.606 | 1,753,306 | 4.068,581 | 12,529,493 |

From this it will be seen that on the Illinois lines there were only two years, 1881 and 1882, that had greater earnings than 1886, and these were extraordinary years over the whole country. The Iowa lines earned more in 1880, 1881, 1882 and 1883, the best results being reached in 1883 when they reached the sum of $2,025,110.

The Southern Division is less than it has been for the last three years, but greater than any of the preceeding years. The total earnings are less than they were in 1881, 1882, 1883 and 1885, but not largely so. The earning per mile of road on revenue from all sources was in 1885, $6,108—and in 1886, $5,867—a slight decrease.

There was, however, a slightly greater decrease proportionately in expenses, the decrease in gross earnings being $91,770, and in expenses $85,924, so that the proportion of operating expenses to earnings in 1886 was 52.20 per cent., being .30 per cent. less than in 1885.

The increase in freight earnings over 1885 was $186,231, or 2.3 per cent., while the increase in the tons carried one mile was 96,558,884 or 15½ per cent. This small increase in the revenue compared with that of the business is accounted for by the decrease in rate, which in 1885 was 1.31 cents, and in 1886, 1.16 cents, being .15 cent less, or 11.5 per cent.

There was a decrease in passenger earnings of $322,807, or 11.3 per cent., while the decrease in passengers one mile was 14,445,133, or 12.7 per cent. This business was abnormally swelled during the first half of 1885 on account of the large travel to and from the cotton centennial and Industrial exposition at New Orleans, and hence the decrease in 1886 when the business returned to its normal condition.

The express earnings increased from $240,270 to $276,003, a gain of $35,733, or 14.8 per cent.

The earnings from sleeping cars decreased $22,877, the difference being accounted for, no doubt, in the same way as the decrease in passenger earnings.

The chief increases in operating expenses were in train expenses $68,909, and in maintenance of structures $50,338. The former caused by the increase in the freight business and the latter by necessary repairs.

The principal decreases were: In maintenance of equipment, $92,892; in maintenance of way, $86,705; and in sleeping car expenses, $31,323. The last is accounted for by decreased business, as heretofore mentioned, and the two first economies could be made with propriety on account of the large expenditures made in those department during the last four years.

The results of the year from operation were about the same as in 1885, the net earnings being only $5,846 less, notwithstanding the fright rates decreased 11.5 per cent.

The economy of the management of roads is not indicated surely by the percentage of operating expenses to earnings, because of the variation of rates on the same road or on different roads on account of location.

This company is operated at 52 per cent. of earnings, and its average freight rate is 1.16 cents per ton per mile, while, the average rate on the Pa. R. R. on its lines east of Pittsburgh and Erie is 7½ mills, and on the Erie R. R. east of Buffalo and Salamanca 6.6 only. Now for illustration, suppose the gross earnings were reduced 25 per cent.; then the proportion of operating expenses to earnings instead of being 52 per cent. would be 69⅓ per cent. Herein lies the danger to be guarded against in the future.

The tendency is toward lower rates. In the East they have about reached their minimum, but in the West and South the fight for their maintenance has but commenced.

It is to be regretted that the expenses are not divided between passenger and freight business, so that the cost per passenger per mile and per ton per mile can be ascertained—the best tests of economical management. It is true that this cannot be done with exactness, but if those expenses which do not naturally divide themselves are divided on a basis of locomotive mileage, the figures will be approximately correct, and can be compared with some of the best managed roads where similar practice prevails.

The construction of the Chicago, Madison & Northern Railroad, the extension of the Yazoo & Missouri Valley Railroad, and the acquisition of the Chicago, Havana & Western and the Rantoul narrow-gauge railroads seem to be in the interest of true economy.

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A report says the Canadian Pacific on its Pacific Division requires its trainmen to keep out of parlor, sleeping and private cars, even driving a rear brakeman to the platform

when he would be allowed inside if the last car were of the ordinary kind. Some roads believe that brakemen should ride outside at all times; on these of course the rule would do no harm; but believers in the theory that the more comfortable a man is the more alert will be his mind and the more efficient his attention to his duties, would deem the coldest road in the country a somewhat cruel place to begin this rule.

Although conductors, who are supposed to be somewhat "genteel," are included in the ostracized class, the root of the rule doubtless lies in the fact that the average trainman is likely to be more or less objectionable to the people who use these cars. It is incongruous, to be sure, for a twenty thousand dollar car, ocupied by hundred thousand dollar passengers, to be occupied or even attended by a man with dirty or ragged apparel or one of uncouth behavior. The home attendants and servants of these passengers and the car-porters (who *must* ride in the car with them) are not selected without some consideration of their qualifications in the line of suavity, and those who pay a fair price generally succeed in getting men and women whose presence is not objectionable; so the simple and consistent remedy in this case would seem to be the employment of men who correspond with the surroundings. A gilt-edge car should have gilt-edge men to go with it; then there would be no trouble. Of course a trainman should not haunt passengers or look over their shoulders; but a car that has no place for a brakeman's seat where he will not annoy passengers is lacking in proper appointments.

The battle of the heaters goes on, and the conflict over safe and unsafe lighting never ceases. Out of much discussion the truth will gradually get itself evolved and the best systems will live. Meanwhile the principle stands that the best way to avoid the disastrous consequences of collisions and derailments is to have no derailments or collisions, and it is gratifying to see that another great line has determined not to run fast trains with slow appliances. In our news columns it will be seen that the Erie is about to block its main line and to equip with interlocking apparatus the crowded approaches to the New York terminus.

### Record of New Railroad Construction.

Information of the laying of track on new railroad lines in 1887 is given in the current number of the *Railroad Gazette* as follows:

*Oregon Railway & Navigation Co.*, between Walla Walla, Washington Ter., and Pendleton, Oregon, 7 miles.

*Puget Sound & Gray's Harbor*, Washington Ter., 9 miles.

*St. Louis & San Francisco*, Arkansas Division, from Fort Smith, Ark., south, 44 miles since Nov. 5, and from Paris, Tex., 16 miles; total, 60 miles.

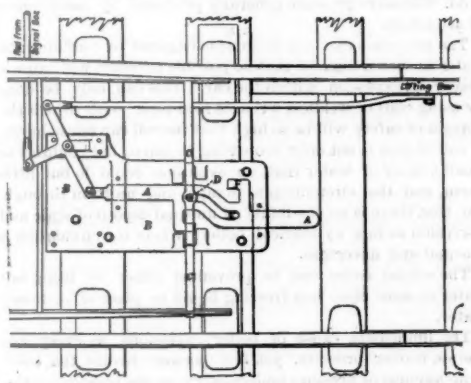
This is a total of 76 miles for the week, making 532 miles reported thus far for the current year. The new track reported to the corresponding date for 16 years has been:

| | Miles. | | Miles | | Miles. | | Miles. |
|---|---|---|---|---|---|---|---|
| 1887 | 532 | 1883 | 329 | 1879 | 204 | 1875 | 99 |
| 1886 | 213 | 1882 | 823 | 1878 | 215 | 1874 | 180 |
| 1885 | 131 | 1881 | 427 | 1877 | 102 | 1873 | 348 |
| 1884 | 286 | 1880 | 733 | 1876 | 285 | 1872 | 566 |

This statement covers *main track only*, second or other additional tracks and sidings not being counted.

### Locking Gear for Switches.

We produce from *Engineering* the cut which is described here. This switch-moving and locking mechanism is the invention of Messrs. Langley and Prince, the former of whom is the engineer to the Midland Railway at Derby. The distinctive feature of the arrangement is that only one lever is required in the signal-box to perform the double duty of moving the points and of unlocking and locking them. Both these functions find their origin in the sliding-plate *A*, the locking being done by the projections *F*, which take into slots in the bar *C* connecting the points, and the tongues being moved by the roller *D* working in the curved slot *E* in the plate. When the man in the signal-box pulls over the lever the plate *A* is drawn endwise; first, the crossbar *C* is unlocked, then the roller enters the curved part of the slot and puts over the points, and finally the second bolt *F* locks the bar again. The lifting bar is operated by a rod from the bell-crank which works the sliding plate.




Langley & Prince's Locking Gear for Switches.

This device, precisely as shown in principle, and nearly identical in detail, was designed in 1878 for the Toucey & Buchanan Co., of Harrisburg, then building interlocking apparatus under the Saxby & Farmer and the Toucey & Buchanan patents. It was not put in use at that time, however, as it was thought that the requisite throw of switch points could not be had without such proportions of the slot or intermediate bell-cranks as would make the lever pull too hard. It is quite possible, however, that with the perfected fittings now in use, and the sliding plate protected from snow and ice, the device might be quite practicable and one lever eliminated from the frame.

### Schwartzkopf Gauge Glass.

From *Glaser's Annalen* we extract an illustration of a neat form of gauge glass for boilers, in which the imperfect indications given through unequal pressures at the upper and lower connections of the usual gauge glass are avoided by using a slit in the boiler and covered by a glass plate, so that practically a vertical section of the boiler is shown. The glass is set in the front of an oblong box bolted to the front of the boiler, as shown by figs. 1 and 3, and the box is furthermore provided with a cock for shutting off the boiler when a glass is to be renewed, and with a connection for the pressure gauge.

Fig. 1.

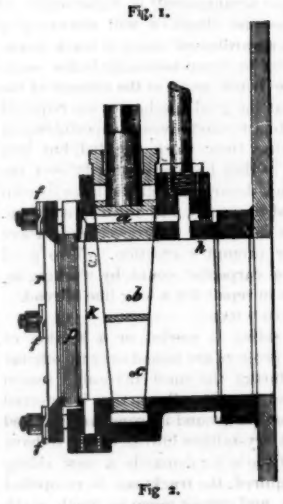
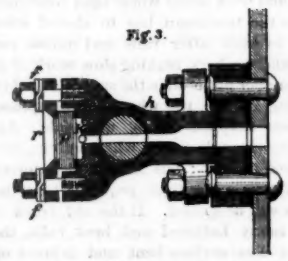


Fig 2.



Fig. 3.

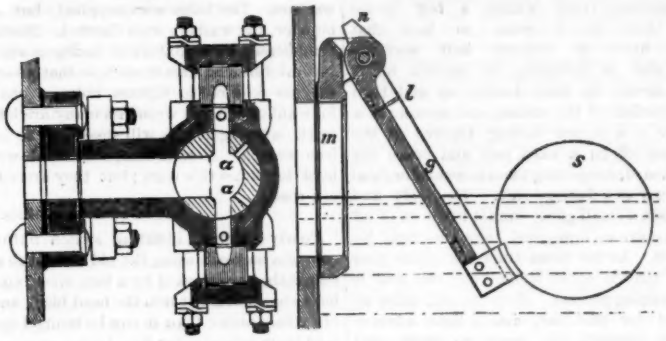


Schwartzkopf Gauge Glass,

The cock is furnished with passages shown at *a*, *b* and *c*, which answer the purpose of gauge cocks when the water is shut off from the glass. They are so arranged that by turning the cock a certain indicated amount, connection is made to the blow-off by one or other of them without opening the regular slit which puts the glass in action.

Fig. 5.

Fig. 6.




SCHWARTZKOPF GAUGE GLASS.

Cleaning of the back of the glass *p* is effected by shutting off the slit by one-eighth turn of the cock. The blow-off *z* is then opened, and then by another eighth turn of the shut-off cock steam is directed through the passage *a* against the back of the glass.

These glasses are also made double—that is, the box is provided with a T end, as in fig. 5, having a glass on each end of the T; and the box can also be fitted with a float-flap valve, shown by fig. 6, for the immediate cutting off of the boiler in case of rupture of the glass. This part of the apparatus has not come into practical use, because the rupture of a glass never occurred.

The apparatus is patented by Richard Schwartzkopf, whose ingenious safety appliance for boilers we recently illustrated.

## Contributions.

### Car Heating by Warm Air.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Having read the article in the last number of the *Railroad Gazette* in regard to our hot air heater, I beg to submit that the writer of the article has failed to study, or at least find out, the details of the apparatus, so as to enable him to understand how it would serve as a first-class heater and ventilator, very much cheaper than any in existence, and entirely free from the dangers arising from both the steam and the stove-heating process.

From all the reports of the commissions and experts so far, steam heat has been suggested and settled upon as the most feasible. The principle objections to steam heat are the danger from bursted steam pipes in a wreck, and the draft on the locomotive while running. Our machine being a combined steam and hot-air heater we will use steam while the train is not in motion, and air while it is in motion.

There can be 60 square feet of heating surface placed in an ordinary extension smoke-box, with ample space between the pipes to allow the sparks to pass freely, without any danger of their choking, and at the same time leave room to carry as many as can be carried at present, as the air would keep them cool, while at present the bulk of sparks would heat the smoke head to such an extent as to burn and injure it. The 60 feet of heating surface would easily heat 600 cubic feet of air from zero to 500 degrees per minute, which amount of air will easily pass over the heating surface by using a positive blast blower and exhauster, such as the Root machine. Five hundred cubic feet of air heated to 500 degrees would be ample to raise the temperature of ten or twelve passenger cars from zero to seventy degrees. The blower would be driven from the axle of the nearest truck, and require such a small amount of power that it would be impossible for any one to tell what it was. The blower would only run 100 revolutions per minute, while the car axle would run about 250. The blower requires no power of consequence to operate it, seven-tenths of a pound per square inch being sufficient to overcome the friction and transmit the air to the cars.

Our special coupling, for which letters patent have been applied, will cause the connections between the cars to be made as easily and quickly and effectually as any air brake or steam coupling now in existence. The air inlets at front of the locomotive can have return bends on them in heavy snow storms to prevent snow from choking them. The blower will only be used by direct steam when the train is delayed for a short time, not sufficient to change from air to steam heat. On such occasions the locomotive will be blowing off steam, and consequently it would not cost the company anything to use the wasted medium at that time. The heat gathered around the stack and from the animal heat of the passengers would more than make up the loss by radiation, so we can calculate on the full 60 feet of pipe surface in the smoke head, and I claim that the heat taken from around the stack and from the smoke head would be absolutely lost if not used in this way.

LEWIS B. WHITE.

### Track Affairs.

CANON CITY, Colorado.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have found in your journal a great deal of valuable matter pointing to the most economical methods for conducting affairs in all branches of railway service. But there are some important items in the track department that have apparently escaped due attention, and I now propose to discuss some of these neglected matters.

HAND-CARS.

I will consider first the heavy, ill-proportioned, unmechanically-constructed hand-car, with neither speed nor

power in its gearing. It has an excessively long lever, with a stroke extending from within a few inches of the operator's toes to a point so high that he looses control until it returns half way on the down stroke; and in following its motion he is compelled at every stroke to first double up and then straighten out in imitation of the closing and opening of a jack knife. The lever is a rotten casting, tapered at the ends so that it will snap off on a hard pull and cause the operators to fall overboard, subjecting them to serious or fatal injury, and the company to a damage suit. The body and wheels are so heavy that a small gang cannot lift it on or off the track, and the axles are so light that they are bent by dragging it off endwise. At the same time the main gear wheel is hung so low that it often strikes the rail and is broken during this dragging process. Four to six miles an hour is a high speed for this car, and a light adverse grade or head wind compels the gang to walk and push in order to save time and labor. The needless weight and the make-up of such cars contribute more to their distruction than to their strength, and often lead to having them smashed by trains in cases where a light handy car could be saved. The best car has a light body and wheels, stout axles, gearing hung high, and so proportioned as to yield the greatest amount of power and speed obtainable from the force applied. It has a short wrought-iron lever with forked ends, each prong terminating in a broad, substantial eye-band, which holds the handles securely and supports them toward the ends in a manner that prevents their being wrenched loose or broken in the middle. Four men can run this car 12 to 15 miles an hour easier than they could run five miles with the inferior one, and there will be no necessity for pulling it to pieces in a struggle to urge it over the road, or injure it by dragging it on or off the track as in the case of its lubberly relative. A track gang on a five-mile section can run the round trip over their track in an hour with a good car, while it would take at least two hours to make the trip with an inferior car. At this moderate estimate we have here an item of waste amounting to ten per cent. of the time of all track gangs operating with inferior hand-cars. The annual loss in a gang of five or six men will foot up not less than the price of three first-class cars, and when figured for a long line of road employing many gangs will show a sum total that should astonish the economical manager.

### TRACK SHOVELS.

This tool plays an important part in maintenance of way, especially on mud and gravel roads, where it is generally relied on to do all tamping of track. Plain wooden-handled shovels are of little value on such roads, as they are liable to break during the first day's tamping, and the various patterns of iron-handled shovels that I have met with are very far from being as durable and effective as they should be. Some of these have a thread cut on the wooden stem for a space of two inches to match a corresponding thread cut inside the socket of the iron handle, and the two parts are screwed together. Others are mortised together and have a rivet passed through the socket and stem, and in each case the wood inclosed by the iron socket is only one inch in diameter by two inches long. Another pattern has the stem split at the end and a wooden cross-bar framed in; this is covered by a thin plate of metal which is held to place by a rivet through the cross-bar and downward extensions of the metal. This handle is fairly durable in sand or light soil, but is too frail for gravel or other rough material. The two patterns first mentioned usually have the iron handle wrenched loose or twisted from the wooden stem long before the blades are half worn, and an otherwise good shovel is consigned to the scrap heap on account of this failure in the handle. There are two ways to remedy this evil and more than double the life of a shovel. The iron socket should be made larger in diameter and not less than six inches long, to permit of its clasping a thicker and longer core of the wood. This would ease off the destructive leverage that now exists at the joint of stem and socket, and afford a fairly substantial joint. Or, better still, replace the wooden stem with a light iron pipe of suitable size, and either bend the end of it to the desired shape for a handle, or insert the lengthened and properly shaped socket of the common cast handle into the end of the pipe, and rivet securely. Also make the stem about a foot longer than in the ordinary shovel, as this would allow the workman to assume a less tiresome position, and enable him to deliver his tamping blows more forcibly and more nearly in a horizontal direction than with a shorter shovel. The extra length might prove awkward in common shoveling, but I am satisfied that it would afford great advantage at both ends in tamping track. One of these handles would probably wear out several blades, and provisions could be made for having them refitted. Any good shovel blade will last a year or more in track work, while the best handles that I am acquainted with will fail in three months' tamping, and often become so loose in half this time as to annoy and hinder the workman at every movement. The railroad officers and the manufacturers who unite in introducing into service a really good track shovel will confer on railroad companies and trackmen a greater benefit than may be apparent at first sight.

### TRACK BOLTS.

Sometimes bolts are much too long, and cause waste of time in putting on or taking off nuts; or the thread does not extend far enough on the bolt to permit of screwing the nut to a snug bearing on the plates, unless washers or nutlocks are used. And because these are not provided, the fastenings remain loose and jingling, causing low joints, bent and broken splices, and the speedy destruction of the rails at the ends. I saw a long line of track ruined by this means a few years ago; in that case the plan called for long bolts and thick washers. The bolts were supplied, but through some one's blunder, the washers were omitted. Matters are still further complicated by a mixture of hexagon and square nuts, with several different sizes of each, so that several sets of wrenches may be required to tighten bolts on one mile of track, and for want of suitable wrenches many are left loose. Two days' work on hexagon nuts will wear out the jaws of the common iron wrench. A well tempered steel wrench would do at least ten times this work; but they are seldom seen on Western roads.

### FROGS AND SWITCHES.

Poorly designed, ill-fitting switch fixtures are still quite common on roads using the old style stub switches with head stands that are worked by a long lever, and narrow cast-iron head chairs that cut into the head block and rock it down out of surface faster than it can be tamped up. The chairs may hold their rails exactly five inches apart, while a "throw" of the lever will move the slide rails either 4¼ or 5¼ inches and produce a bad "lip" in the line, no matter how much care may be taken in adjusting the stand. Misfits of this kind generally arise from a failure to centre the bolt holes in the lever a proper distance apart. Add to this half an inch of lost motion found in connecting rod and stand, two tie-bars one-half inch short and two more three-quarter inch too long for track gauge, have some clamps too narrow and others too wide for rail base, use 50-pound head chairs for 60-pound rail, so that the sides and top of the rail base must be chipped off before chairs will go on, then add a long, unwieldy frog, built on a big iron plate and paved with bolt heads underneath, so that a lot of switch timbers may be ruined by adzing notches for it, make the flangeways very wide, and have metal filling omitted, so that point and wing may batter down quickly, and when taking out an old frog, have the new one a few inches longer or shorter than the old one, so that most of the switch will have to be remodeled and lead rails cut to fit it in, and we have a good description of the switch fixtures used on many roads at the present day. There are plenty of well-constructed, smooth-bottom, rail frogs in the market, and several patterns of wrought-iron head chairs that will catch two timbers and never rock head blocks out of surface. There are also plenty of neatly adjusted switch stands and rods to be had on call. These would probably cost but little if any more than the inferior articles, and I see no reason why the better class are not used everywhere, except that some officers don't know the difference between good and bad material, or else they don't care.

### REPAIR SHOPS.

It is customary to have hand-cars and track tools repaired by the motive power department. This works well enough in some cases, but as a rule the arrangement is unfavorable to the track department, because shopmen will always give preference to engine work regardless of delay to track work. And if there is an apprentice or cheap mechanic in the shop, he is allowed to practice botch work at the expense of the track department so long as the good mechanics are required for other work. The roadmaster and division superintendent may protest against having their work slighted, but this seldom does much good, as they have no authority over the offending parties. The track department should have its own repair shop, and be allowed to employ and control its shopmen. Then if work was delayed or improperly done there would be a good show for prompt correction. Two good men, a blacksmith and a carpenter, could, by working together, keep tools and cars in repair for a long line of road.

### COLD DAY.

Sometimes when a new siding is needed, or a section of track is to be relaid, these projects are talked over in official circles for many months during the most favorable season for doing the work well and cheaply. But action is deferred until mid-winter; then when the ground is frozen and covered with snow, the official talk crystallizes into an order to have the work done at once. If the order demands a new siding where light grading is required, the trackman is compelled to fight frost with his pick, and cannot move as much earth in a day as he could handle in two hours before the ground froze, and the job will be so rough when completed that it must be remodeled in the spring to give it a decent finish. Relaying track in snow and frost is still worse than constructing sidings. In this case the trackman has to shovel snow from the track, grope in snow after rails and splices, and fumble over bolts, nuts and washers, making slow work of it, and losing much of the smaller material in the snow. His claw bar is continually slipping on the ice when pulling spikes, and the heads of spikes are snapped off by wholesale. Another tough and expensive struggle ensues when moving ties under new joints in frozen ground; but if this is deferred until the frost thaws out, it is more than probable that the expansion arrangements will be spoiled. If the old track is in bad surface and has many battered and bent rails, the new rails will be more or less surface bent and injured on account of the difficulty found in raising and tamping low spots on frozen ground. A farmer managing his work on this principle would have his rail-splitting and fencing done in September and his plowing done in January, and then growl at the hired man about bad plowing. No argument about cheaper labor in the winter will justify such management.

### "JACK SHALL HAVE A NEW MASTER."

There is no branch of railway service that is so often placed under the general supervision of men who have no practical training to qualify them for its management as the track department. Superintendents of motive power and machinery, bridges and buildings, telegraph and water service, etc., are practical experts in their respective lines of business, and are rightly permitted to manage the details and have a voice in all essential matters pertaining to their respective departments. But this important principle is seldom applied to track service, as its supervision is generally in the hands of a division superintendent, who came up by way of transportation, station, or telegraph service, and knows no more about track than he does about watchmaking, never having worked a day at either trade. He does not pretend to know more about machinery, bridges, buildings, etc, than men who have spent half a lifetime in becoming experts in such matters. But in talking about track, the average superintendent will make it appear that if there is any one thing that he is thoroughly posted on from away back, and knows more about than the oldest "jerry" of them all, it is the care and management of track, and trackwork. If a wise and appropriate suggestion is offered by the experienced foreman or roadmaster, they are liable to get snubbed in a manner that will discourage them from coming again, and deter them from taking proper interest in their work. When tools or material are called for, the superintendent orders what he prefers, and the purchasing agent will probably send something else, regardless of how it suits the superintendent, roadmaster, or the work it is required for. In fact the trackman is seldom allowed any choice in selecting supplies for his work, but must take what he gets and be mute, and if his work suffers injury from the bad management of his superiors he must bear the blame.

### CHEESE PARING.

When expenses are to be cut down, it is customary to reduce force and wages in the track service, regardless of losing good men, or crippling the force to an extent that results in detriment to the road.

This race between railway officers in reducing the trackman's wages and otherwise belittling him has been carried so far that it leaves but little inducement for good men to enter this branch of service. Good men are not content with a situation that offers only slurs, hard work and poor pay, and as they intend to leave it at the first favorable opportunity, they take little interest in learning to become useful or efficient in a business that offers them no reasonable encouragement. The indifference and apparent inefficiency brought about in this way is the prime cause of all condemnation that trackmen receive as a class. This department is often in the position of an orphan with an unfriendly guardian who grudgingly contributes a few ill-fitting garments, and then grumbles at his ward for failing to make a more desirable appearance. The other departments fare better, because they have friendly parents who understand them thoroughly, and provide intelligently for their wants.

The policy which prevents railroad companies from profiting by the skill and experience of the competent trackman must be abolished before many evils now existing in track service can be cured. General officers who work this field carefully will obtain results of the most important and gratifying character.

D. SWEENEY.

## The Explosions of Car Heaters.

TO THE EDITOR OF THE RAILROAD GAZETTE:

As this question is now attracting considerable attention, it is well to point out that car-heater explosions are, broadly speaking, due to three general causes.

1st. The use of a boiler, which, like all boilers, is liable to corrosion, and when so weakened, has a small margin of safety. The danger of this form of heater is increased when the water space is small, as in a heater recently illustrated in your columns.

2d. Frost plugging up or cracking pipes.

3d. Excessive pressure generally produced by carelessness of attendant.

The last cause can only be guarded against by confining the water in such a manner that no possible pressure will cause a disastrous explosion within the car. This can only be done by using coils of weldless wrought iron pipe, with which the margin of safety will be so high that the coil can never burst. A coil of pipe is not only too strong to burst, but contains so small a body of water that an explosion could do but little harm, and the circulation is so rapid and uniform throughout, that there is no possibility of unequal deposit of scale and corrosion as in a cylindrical boiler, where the circulation is unequal and uncertain.

The second cause can be prevented either by using salt water or some other non-freezing liquid in place of ordinary water.

The immediate cause of boiler explosions, as every one knows, is over pressure, yet few persons realize the enormous amount of pressure boilers carry, or the reasons for the disastrous results when explosions occur. But the multiplication table solves all this "mystery." The general supposition that the pressure gauge on a boiler indicates the actual pressure within is incorrect. The gauge simply shows the pressure on each square inch. It is but one of the two factors in the case. It is the multiplier, while the aggregate sum total number of square inches on the inside of the boiler is the multiplicand. For instance, when a gauge on a cylindrical boiler, say of 3 ft. diameter and 12 ft. long, marks "100," the actual pressure within that boiler sheet, and two heads, is 1,830,600 lbs. Nearly two million pounds (avoirdupois) pressure from the imprisoned water and steam trying to escape. Perhaps the attaching of a hundred-pound weight (by some mechanism of hooks, pulleys, cords, etc.) to each one of these square inches—on even a single inch of the length of this boiler, would help give a correct impression of a small fraction of the magnitude of this force. And if one of these 100-lb. weights should by chance fall on his person a partial realization of the danger to life and limb in case of bursting or the more sudden and violent explosion would be given.

Of course anything of a boiler nature—anything that pre-

sents any surface beyond a few square inches to the pressure within, is inadmissable for a heater if placed within a car or beyond the care of a special attendant—as all steam boilers are. M. M.

## "Are Independent Wheels Desirable?"

PHILADELPHIA, Feb. 25, 1887.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Referring to the article in your number of Feb. 11, "Are Independent Wheels Desirable," I propose to quote some evidence in the affirmative, as follows:

In addition to the "little road from Paris to Sceaux," which you mention, there is at least one more railway operated successfully with independent wheels. Please refer to the *Railroad Gazette* of May 9, 1884, where you will find copied a portion of a letter to the Chicago *Inter-Ocean* which describes a narrow gauge road on the Himalaya Mountain. But the fact that it is operated by cars using independent wheels is carefully omitted. After describing the scenery and the road from Calcutta to Silliguri, another writer goes on to say:

"The Darjeeling & Himalaya Railway was laid at first as an experiment on the government cart road, but like many other experiments has passed that stage and is an established and paying fact. The curious part of it is that it is the only road in the world on which loose or independent wheels are used exclusively. The entire rolling stock is equipped with a loose wheel identical with the 'Harrison Patent.' I made a thorough inspection of the axles and made inquiries concerning their working, and was informed that without these loose wheels it would be next to impossible to operate the road.

"Is it not strange that while the Americans, with their boasted mechanical ingenuity, have been disputing the utility and advantage of such things, we find a small, obscure road in the Himalayas using independent wheels? When I say that in the whole 40 miles in the mountains there is not a single length of straight track longer than 200 ft., and if all the straight parts were put together they would not aggregate half a mile, you can form some idea of the crookedness of this little road of 24-in. gauge, whose cars are not much bigger than an ordinary two-seated carriage, climbing mountains with grades 260 ft. to the mile and around curves of 90 ft. (and less) radius, until it reaches Darjeeling, 7,200 feet above the sea, and distant from Silliguri 48 miles, although in a straight line the distance is less than 20 miles. If a road was made on purpose to test loose wheels, it could not improve on the Darjeeling & Himalaya Railway."

When we consider that Mr. Wells' tests were made with a toy, with wheels 2 inches in diameter, the track arranged on a board 15 feet long—I think it was—a pendulum beating seconds to register the speed of each trial, it is fair to presume that his report is as wide of the mark as where on page 160 he asserts, "the tension brought upon the axles by the one wheel gaining and the other losing while sliding on the rails, does not affect the force necessary to move the truck along the track. The tendency of one wheel to gain on the distance passed over exactly balancing the tendency of the other wheel to lose."

If *two slides* do not produce 100 per cent. more friction than *one slide*, then I give it up.

An imperfect test was made on the Lehigh Valley Railroad Feb. 28, 1882, with a car fitted with the Miltimore compound axles and a car fitted with common axles and rigid wheels. The test was made on a portion of the line near Bethlehem, Pa., having a curve in each direction, with a short tangent between, the grade being level.

Mr. H. Stanley Goodwin, Assistant Superintendent, stated: "The test was made by pushing the cars up to a rate of speed varying with each trip, and then stopping the engine letting the cars run away freely.

"We took account of the distances made in each run, from the point where the cars commenced to run away from the engine to the point where they stopped, the distances being given in rail lengths, each of 30 ft.

"Number of trips, 11. Miltimore car ran total 378 rail lengths; ordinary car ran total 303 rail lengths; extra distance run by Miltimore car about 25 per cent."

There appears to be a great diversity of opinion among engineers as to what is really the correct amount of "pounds per ton," as the measure of curve resistances, as may be seen the by what follows:

*Part of a table of Curve Resistance in Railroad Gazette, Oct. 11, 1878*

| Radius. | 100 | 200 | 300 | 400 | 500 | 600 ft. |
|---|---|---|---|---|---|---|
| Pounds per ton | 38 | 22.5 | 17.5 | 15.2 | 13.7 | 12.7 resist. on level. |

Mr. Joseph Ramsey, then of the Bell's Gap Railroad, argues against the calculations in said table, and claims that resistance is just double.

See *Railroad Gazette*, summer of 1878.

Mr. A. M. Wellington in *Gazette*, 1878, is reported as saying: "The resistance on steam roads due to curves is 62.5 lbs. per ton of load on each wheel. So an eight-wheel car, weighing 10 tons, with load of 10 tons, in all 20 tons, has a resistance $20 \div 8 = 2.5 \times 62.5 = 156.25$ lbs. on each wheel."

There is nothing said about "radius," therefore the quotation is unreliable. Mr. Octave Chanute, C.E., in an address before the Am. Soc. Civil Engineers, June 5, 1878, quoted in *Railroad Gazette* March 7, 1879, says:

"The resistance in pounds per ton, per degree, gauge 4ft. 8½ in., is—

| | |
|---|---|
| Twist of wheel on rotation on itself | 0.0010 lbs. |
| Slip of wheel on shorter inner rail | 0.1713 " |
| Flange friction to change direction | 0.2450 " |
| Loss of power at coupling from 0.0020 to | 0.0213 " |
| Total resistance per degree per ton | 0.4386 " |

"We may assume, therefore, that the result of the investigation is that curves add about ⅓ lb. per ton per degree to the resistance on straight lines, some additional elements being stated to have been left out."

The *Railroad Gazette*, March 17, 1882, has a series of tables showing the loads which locomotives will haul at a speed of 20 miles per hour, exclusive of the weight of engines and tenders, all cars with rigid wheels:

| | Engine 36 tons, 4 drivers, 12,000 lbs. on each. Tons. | Engine 54 tons, 8 drivers, 12,000 lbs. on each. Tons. |
|---|---|---|
| On straight level track | 1,096 | 2,226 |
| On 5 degree curve | 921 | 1,876 |
| Loss due to curve | 175 or 15.96 p. c. | 350 or 16 p. c. |
| On 10 degree curve | 662 | 1,358 |
| Loss due to curve | 434 or 39.59 p. c. | 868 or 38 94 p. c. |

Other calculations are given in said table showing the losses due to various grades up to 100 ft. per mile, but the above is sufficient to show the losses on 5° and 10° level curves.

Having thus shown the different views held by experts on the measure of curve resistances, I may conclude with words quoted from your own editorial columns:

"It must be said that the testimony regarding this subject is not in a very satisfactory condition. A new and thorough series of experiments is very much needed."

In a future article I propose to consider the losses to track and rolling stock caused by the use of rigid wheels.

P.

## Drowning Car Stoves.

TO THE EDITOR OF THE RAILROAD GAZETTE:

For several years past there has been, and there still is, considerable talk about "flooding the fire" of a car heater with water, in case of a supposed smash-up of the car. Now, is it within the reach of human ingenuity to so plan and calculate any arrangement that will, just in the nick of time, and in just the proper manner, throw, or allow to be thrown, the right quantity of water on the fire so as to extinguish it when an unforeseen accident occurs?

If the breakage of the stove or other fire inclosure should by chance happen at the right moment and all the conditions were favorable, so that the water—especially the steaming hot water from the heater itself—should actually fall on the bed of red-hot coals, would not the remedy be worse than the evil sought to be averted?

If the fire were bright enough to fire the car the water would instantly flash into steam and would, as in all cases of steam escaping into living apartments, kill all passengers who inhaled the steam and gases thus generated. The smoke that always flies off when even *cold* water is thrown on a hot fire would not only suffocate, but blind the passengers.

AN OLD ENGINEER.

## THE SCRAP HEAP.

### Look Out for the Bogie Man.

And now it is said that the good folk out in Republic, O., are being frightened by a ghost that hangs about the scene of the late disaster. That's no ghost. It is probably the vacuum of a brake hunting round for its shattered residence.

### J. D. Layng.

The Cleveland *Leader*, in speaking of the new president of the Cleveland, Columbus, Cincinnati & Indianapolis, says:

"Personally he impresses one as having a large fund of reserve power. In dress he is scrupulously neat, and his manner is quiet and easy. He is a man of medium height, with silvery hair and mustache, and with a large, well-shaped head. Beneath his calm, light eye may be seen the vigor of the rigid disciplinarian in harmony with his strong, yet mobile features."

### The Atmospheric Week.

And still the snow flies all over the Northern circuit. It flew so densely in some sections this week that people ate the atmosphere instead of breathing it. Drifts 15 ft. deep were reported. Tall men had to stay in their houses up in Hanover, N. H. It snowed for 24 hours in Saratoga, N. Y., on March 6, and when March 7 dawned there was snow cessation. The poor Adirondack road, which had just peeped out from its winter burrow for a minute or two last week, was snugly covered up and tucked in again for another good long sleep. The West Shore, the New York & Massachusetts, the Hartford & Connecticut Western, the Grand Trunk, and the Canadian Pacific are seriously clogged, and two or three locomotives go panting and puffing along on each train at a very uncertain rate of speed. The trains on the two last named roads got stuck perfectly tight last Sunday. The biggest drift heard from is up near Portland, Me. It is 25 ft. high, and still growing.

### There! Minnesota May have the Cake.

WINONA, MINN., March 3.—The superintendent of the Winona & St. Peter Railroad states that between Mankato and Tracy the snow drifts are, in many cases, 6 ft. above the telegraph poles, and that the line men have had to splice scantling to the tops of the poles to get the wires up where they could be used.

[The telegraph poles on Broadway, N. Y., are still in sight. —SCRAP EDITOR.]

### The Parisian Metropolitan Railroad.

We never can tell what arguments will have weight with some men. The latest number of the *Mémoires de la Société des Ingénieurs Civils* gives a long discussion of the project for a metropolitan railroad in Paris, and the most serious reason given for an elevated rather than an underground route is that "the people of London are very different from those of Paris. In London, for two-thirds of the year, the climate is gloomy, cold and unwholesome, above as well as under ground; the streets are almost always muddy, and these reasons which make the underground way quite endurable there do not apply to Paris." Another speaker reasoned that Parisians "would rather be swallows than moles." It would be well for the promoters of the New York underground railroad to stop and think of these things.

### Cooked to Death.

People are altogther too apt to forget that when God made Heaven and Earth the share that fell to mankind was the Earth. There is a supercelestial effort forever exercising itself in the average human breast to make this life Elysian, and scientists collaborate with men about town in the common endeavor to find a sphere where all goes right and nothing goes wrong. Of late, the cold, searching eye of stationary journalism, the passionless attention of the club room lounger, and the electric fancy of the ambitious inventor have turned straight upon railroads. Individual opinion has been spread all over broken rails, twined around defective brakes, and strung out into metaphorical guard rails strong enough to bring the whole universe back on to the right track. The science of this is often very pretty and valuable, and the Commissioners only hesitate in selecting their ounce of prevention because there are so many gallons to select from. The superabundance is a trifle bewildering. The interesting discussion in which bright minds are so excitedly entangled is really induced by a poetic belief that if things were only arranged with the requisite care and skill such a thing as a railroad accident would never occur. It is one more effort to subtract earthiness from earth, and leave ideality. Now, if an isle of the blest could be found basking tranquilly somewhere in a sapphire sea, the list of railroad calamities there would probably be quite limited, provided the isle was contracted enough to make a stroll around its rim a pleasant appetizer. But, if there were any bridges to build, any snow sheds to erect, any necessity for a fire to keep from freezing, or for a lamp to read the newspapers by, then it is only a question of time and the blessed steel rails would crack some fine but cold day, and there would be food for the reporters at once and your ideality knocked into a cocked hat at one swoop. This is a very wide earth, especially the American section of it. The death rate is necessarily large, and if rapid transit was done on snowy pinions, accidental removals would probably be none the less frequent. The car stove and the crumbling bridge would surely be substituted by agencies just as fatal and unpleasant. The "great divide" has to be traversed one way or another. All men may not fade and flicker out through a stage of senility or drop quickly stricken with paralysis. Roofs must fall; pneumonia must devastate; lightning must strike, and if men demand that they be transported through space with the velocity of a South Pacific monsoon, why, something will break occasionally, even though all the scientists on this green earth go into determined conclave and do their best to prevent it. This is not fatalism; it's business.

### Is Swinburne in Texas?

Fort Worth's bouquet of railroads will soon have some rare and beautiful flowers added to the collection.—*Fort Worth (Tex.) Gazette.*

### Stop Thief!

Tickets to the value of $1,500 have been stolen from the New York, Lake Erie & Western office in the Twenty-third street Ferry House in New York. The list of the missing tickets is as follows: New York to Omaha, O. Y. 796, Nos. 14, 15, 16, 17, 18, 19 and 20; New York to Kansas City, O. N. 683 H., Nos. 3, 4 and 5; New York to Fort Scott, O. W. 3,430, Nos. 5, 6, 7, 8 and 9; New York to Lincoln, form O. C. 1,283, Nos. 5, 6, 7 and 8; New Orleans to Sacramento, O. X. 4,485, Nos. 4, 5, 6, 7, 8, 9, and 10; Kansas City to Sacramento, O. X. 4,175, Nos. 4, 5, 6, 7, 8, 9 and 10; St. Louis to Laredo, X. 4,659, Nos. 4, 5, 6, 7, 8, 9 and 10.

### The Crop of Winter Wheat.

The Chicago *Farmer's Review* prints the following summary this week:

"Thus far the reports from the winter wheat belt indicate that the crop is emerging from the winter in better shape than last year. The crop is not assured from the resulting damage of storms and bad weather, and still has to pass through a critical period; still, as a whole, the outlook must be regarded as more favorable than at the beginning of March of last year. The extremely mild weather of the opening days of last week, followed by the cold weather, caused some injury in Illinois and in Indiana and in La Porte and Randolph counties of Indiana considerable wheat was frozen and killed. Twenty-three Illinois counties this week report the wheat as looking well, while in Brown, Johnson and White counties injury is reported. Thirteen counties of Indiana make very favorable returns. In Michigan and Wisconsin the outlook is reported as very favorable. Nearly all the Wisconsin fields have had an ample snow covering since last November. The weather has been unfavorable in Ohio, and some injury is reported in Champaign, Seneca and Van Wert counties, but all the other counties reporting make favorable returns. The season is well advanced in Missouri, and spring plowing has commenced. In Bates, Benton, Christian and Montgomery counties oats are already being sown. In Clinton, Knox and Livingston counties of Missouri the wheat is reported as looking poorly, but the other county reports are mainly of a favorable tenor. There is no change in the tenor of the reports from Kansas. Fully one-half of the counties report a very poor outlook for wheat. In Harper County, not more than one-half the average crop is predicted, while in Clay, Davis, Mitchell, Reno and Rock counties the situation is poor and the crop is in a critical condition."

## TECHNICAL.

### Bridge Notes.

The Phœnix Bridge Company of Philadelphia has received the contract for building the new bridge across the Ohio River at Cincinnati. The bridge will be double track, will consist of three 500-feet spans, and will contain 10,000 tons of steel. The Phœnix Company has a number of other large contracts, among which is that for the construction of a draw bridge for the Central of New Jersey Railroad at Newark, N. J.

The contract for the superstructure of the Atchison, Topeka & Santa Fe's bridge over the Missouri River at Sibley, Mo., is let to the Edgemoor Iron Co., of Edgemoor, Del. The bridge will be 95 ft. above low water mark, and will consist of 3 spans 400 ft. long across the main channel, an approach of 200 ft. on one side, and three approaches, one 250 ft. and two 175 ft. each, on the other side, and 1,900 ft. of iron trestle. The contract for the superstructure of the bridge at Fort Madison, over the Mississippi, has been awarded to the Union Bridge Company, of New York. It will consist of a draw span 400 ft. long, a raft span 275 ft. long, four spans, each 237½ ft. long on one side, two spans, each 150 ft. long on the other, and 1,000 ft. of pile trestle and embankment.

### Manufacturing and Business.

The Union Switch & Signal Co., of Pittsburgh, Pa., has removed its office and works to Swissville, Pa.

The Indurated Fibre Co., of Lockport, N. Y., has received an indorsement for its pails from the Chicago Board of Underwriters. It reads:

"GENTLEMEN: I have examined the fire pails manufactured by the Indurated Fibre Co., submitted to me some days ago, and would be pleased to recommend them in any factory where our schedule requires pails of water.

"I consider it far superior to the wooden pail, and it is more economical than any other pail in the market.

"(Signed), T. A. BOWDEN, Supt. of Surveys."

The company has opened an office at 19 and 21 Wabash avenue, Chicago.

Mr. George H. Carey, of New York, has sold to the Kansas City, Independence & Park Railroad the 12 short, 28 ft. passenger cars which have been used on the New York &

Brooklyn Bridge since its opening. The bridge cars are replaced by longer ones built by the Pullman Company.

### Iron and Steel.

Perry & Co., stove manufacturers, are enlarging their works at Albany, N. Y., as well as building new works at South Pittsburgh, Tenn. Their contract for 900 molders at Sing Sing prison expires the 1st of March, and it will not be renewed.

The Chattanooga Steam Forge Company has purchased a site for its immense establishment at that point, and the erection of buildings will be commenced in a few days. It will be the only steam forge in the South.

The new shops of H. M. Boies, manufacturer of Boeis steel wheels at Scranton, Pa., have been completed, and the manufacturing of wheels has commenced.

The Chicago Steel Manufacturing Co., whose works are at Hammond, Ind., will have its Bessemer plant running in March. The plant is being built by James P. Witherow. The steel will be used in the manufacture of nails and various specialties. The works now under construction embraces a Bessemer steel plant, rolling mill, nail factory, machine shop, blacksmith shop and cooper shop. The works will produce about $2,000 kegs of nails per day when in full operation. Marcus M. Towle, of Hammond, is President of the company, Joseph T. Torrence is Vice-President and General Manager. Their Chicago office is in the First National Bank Building.

The 1,000 employés at the Britton Iron and Steel Works, Cleveland, O., have had their wages increased 10 to 15 per cent.

The coal miners of the Clearfield region have had their wages advanced ten cents per ton.

The Marshall (Tex.) Car Wheel Foundry Company is enlarging its works by constructing a new building 75 × 100 ft. New water works are also being erected, and other improvements are being made.

The Maumee rolling mills at Toledo, O., have resumed operations after a long period of idleness. One hundred and fifty men are employed at present and this force will be increased until the number reaches 800—which is the full capacity of the mill.

The Taylor Iron Works at High Bridge, N. J., have announced an increase of 10 and 12 per cent. in wages to the 200 employés in the car and axle works. The advance was unsolicited.

The 325 employés of the Ellis & Lessig Steel and Iron Company, of Pottstown, Pa., have been granted an unsolicited advance of 10 per cent. in their wages, dating from March 1.

The wages of 650 miners in the employ of the Superior Iron Co., at Ishpeming, Mich., were raised 15 per cent. on March 1.

The Schuylkill Steam Forge, at Douglassville, Berks County, Pa., has been abandoned, and a rolling mill for the manufacture of muck bar is being built on its site. The Douglassville Iron Co., Limited, is the name of the new rolling mill company, of which D. K. Flannery is President; John H. Egolf, Treasurer; Dr. F. R. Gerhard, Secretary, and B. F. Morret, Manager.

All the melting at the Chrome Steel Works, Brooklyn, N. Y., is done by gas, and gas for heating is now being prepared for.

Richard Cross has started a new foundry at Cleveland, O.

The Warner & Haugh Machine Co. are erecting works at St. Paul, Minn., for the manufacture of nuts, bolts, car forgings and bridge and architectural iron work.

### Sault Ste. Marie Bridge.

Tenders will be received until noon of Monday, April 4, for the construction of the masonry, iron or steel superstructure and approaches for crossing the Ste. Marie River and Canal at Sault Ste. Marie, Mich. The work to be commenced immediately after signing the contract, and to be completed at the end of November, 1887. Tenders will be received for the entire bridge and approaches, and for the superstructure erected, separately. General plans, specifications and quantities may be seen and forms of tender obtained on and after the 10th inst. of P. Alex. Peterson, Chief Engineer, at the Canadian Pacific Offices, Montreal.

### Vermont Construction Company.

The Vermont Construction Company, of St. Albans, Vt., have contracted to replace the structure over the White River, burned at Hartford, Vt., Feb. 5, with an iron riveted lattice deck bridge, 5 spans, in all 650 ft. The iron is to be rolled at Pittsburgh, and the Vermont Construction Company contracts to erect the bridge within 7 weeks after the iron reaches St. Albans. Four hundred and seventy-five tons of iron will be used, and the specifications call for a minimum tensile strength of 50,000 lbs. per square inch.

The same company last week contracted to build a 150-ft. riveted lattice bridge for the Pittsford & Clarendon road at Centre Rutland, Vt. This is to be an unusually strong bridge, adapted to the enormous loads occasioned by the transport of rough marble from the great Rutland quarries to the mill. The company has completed railroad bridges at Norwood, N. Y., Montpelier, Vt., many highway bridges, and is now building a railroad bridge at Brattleboro, Vt., in which is a 217-ft. riveted lattice span. The officers are R. F. Hawkins, President; S. W. Bowles, Jr., Treasurer, and George A. Ayer, Manager.

### Shaft Sinking by the Freezing Process.

The Poetsch Sooysmith Freezing Co. is making preparations to sink a shaft through water-bearing ground for the Chapin Mining Co. in the Lake Superior iron region. Eight-in. pipes will be sunk to bed rock at intervals of 3½ ft., about the space to be excavated. Through these pipes intensely cold brine will be circulated until a frozen wall is formed, shutting out the water. The excavation will be 22 ft. in diameter and circular, the depth about 100 ft. It will be lined with cast-iron, the sections being bolted together through interior flanges.

### Electric Motor for Boston Street Roads.

Messrs. G. T. W. Braman, Isaac T. Burr, Asa P. Potter, and H. D. Hyde have gone to Scranton, Pa., to examine the electric motor now in successful operation in that city. They make the trip in the interest of the syndicate that is in control of the West End Land Co. and the several street railways of Boston.

### Work on the Panama Canal.

The following interesting information about the great work on the Isthmus is from the San Francisco *Alta California:*

"Work is progressing slowly. The delay is attributed to a lack of laborers and incompetent contractors. There are from 20,000 to 25,000 men at work, and agents have recently been sent to China to enlist more men for the work. The first dredger is 16 miles inland from Aspinwall on the Atlantic, but the channel will have to be widened to twice its present capacity. Ground is broken from ocean to ocean, and men are working at intervals along the entire survey. The heaviest and only cut of moment is at Culebra, which is about 11 miles in extent, and when finished will be 367 ft. below the surface. This cut begins 9½ miles from Panama, and is about one quarter finished. Machinery which cost millions of dollars is scattered all around and no use can be found for it and it is allowed to rust. All the large and paying contracts are given to Frenchmen, who are an easy-going set of people who have not that 'push' that is characteristic with Americans. They take matters philosophically, allowing subordinates to control the work. These officials have strict injunctions not to over-exert themselves. In the army of laborers nearly every nationality is represented, and strange to say the Frenchmen fare the worst of any. Not through treatment, for all are treated alike, but the climate does not agree with them, and few live more than six weeks after arriving. But still they come, every steamer bring a number. The Panama railway is the only road in the world which runs special funeral trains. It runs two daily trains from Aspinwall to the burying ground at Monkey Hill, a distance of two miles, and often in the rainy season ten trains are run out in one day. When the rainy season sets in in April every known fever spreads and the laborers die off like soldiers before a Gatling gun. The East Indians, South Africans and Chinese stand the work and the climate the best, and few of them die."

### Wrought-Iron Car-Wheel Centres.

The Secretary of the Treasury has recently decided that car-wheel centres, consisting of forgings of iron which have been advanced by other processes of manufacture—being bored out for the fitting of the axle, the hubs faced, and the rims turned and finished with a flange of steel bolted thereon to prevent the tires from slipping, but which are not tired—are held to be dutiable at the rate of 45 per cent. ad valorem, for "manufactures * * * composed wholly or in part of iron * * * or any other metal, and whether partly or wholly manufactured."

### Quick Work.

The machine shop of the Calumet & Hecla copper mine, Michigan, performed quite a feat a short time ago in rebuilding a locomotive in 56 hours. The locomotive had been almost destroyed by a fire which had burned some of the buildings at the mine, practically nothing of it being left but the boiler and trucks. The company's machine shop, however, is not a small affair, as it contains 26 lathes, 6 drilling machines, 2 shapers, 4 boring mills, 2 milling machines, 2 pipe cutting machines and 4 planers, and it employs a force of 90 hands, including 56 regular machinists.

### German Railmakers.

Berlin letters say that the effects of the war rumors are severely felt by German railmakers. Foreign companies are chary of placing orders with German makers, fearing the delay in execution which a war would cause. The Minister of Trade, however, states that foreign offers for state railway contracts will not be considered even when lower than home bids. Thus a "paternal government" can keep things comfortable for those whom it chooses to aid—but the taxpayers?

### Whitner Safety Brake Appliance.

A trial of the working of this frangible attachment, described in the *Railroad Gazette*, Feb 25, was had in the yard of the Consolidated road at New Haven, March 3, which was entirely successful. The appliance stops the train in the event of derailment or broken axle.

### The Martin Heater.

The Martin anti-fire car heating system has been finally adopted by the Boston & Albany. This decision has been arrived at after a long series of tests and observation of the experimental train equipped with this heater, which has been running this winter between Boston and Springfield. The New York and Boston daily expresses are now being equipped. On the same trains the Julien storage battery for lighting by electricity is being tried.

### Russian Canal.

The Russian government has contracted a loan of 25 million roubles with the firm of Hersent & Co., Paris, for the construction of the Perekop Canal in Southern Russia. M. Louis Caisseau, a French engineer of Suez Canal fame, is to be the chief engineer. The canal will establish a direct communication between the River Don, the Black Sea and the Sea of Azov, and will also be the medium of connecting several South Russian railway lines.

### Importing Metal Ties.

The railroads of Mexico have ordered over 30,000 metal ties from England, to be delivered and laid on their extensions during 1887. Many of these metal ties are to be used hundreds of miles inland from the point of delivery on the coast of Mexico, after being freighted across the ocean.

Wooden ties are to-day shipped from Michigan to Mexico for the new lines building near the border of the United States to connect with our railroad systems. A good metal tie will outlast seven wooden ones and then be valuable as old metal, say at the end of 50 years.

### The Arthur Kill Bridge.

The Secretary of War having authorized the construction of the Arthur Kill bridge, work will be begun this spring. The bridge will consist of a draw span of 500 ft. and two approach spans of about 125 ft. each. The Rapid Transit Co. issues bonds, indorsed by the Baltimore & Ohio. The whole scheme includes the improvement of 2½ miles of water front on Staten Island and increased boat service between Staten Island and New York. A map showing the general character and location of the proposed terminus on Staten Island and the relative location of points around New York harbor was published in the *Railroad Gazette* Jan. 29, 1886.

### Car Heater Test.

The Owen Car Heater, recently tested at the Grand Central Depot, New York, and illustrated in these columns, was again tested at Albany, N. Y., before the New York State Railroad Commissioners. The heater being placed in a box car the fire was lighted, and the floor of the car was covered with shavings saturated with kerosene. In order to imitate a collision another car was then forcibly propelled against the car containing the heater, which was upset by the force of the shock. The shavings, however, did not take fire, and the leakage from the broken water-pipe soon extinguished the fire in the heater. Mr. Young, General Manager, and Mr. R. C. Blackall, Supt. of Motive Power, and other officials of the Delaware & Hudson Canal Co. witnessed the tests.

### The McKeen Coupler.

The McKeen Coupler Co. have recently received an order to equip with their coupler 1,500 cars now being built by the United States Rolling Stock Co. for the New York, Lake Erie & Western. The McKeen coupler is of the loose link type, with a link controller, and is largely used on the Lehigh Valley and other roads.

## General Railroad News.

### MEETINGS AND ANNOUNCEMENTS.

#### Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

*Chicago, St. Louis & Pittsburgh*, annual meeting, at the office, Indianapolis, Ind., March 16.

*Panama*, annual meeting, at the office, New York, April 4.

*Colorado Midland*, annual meeting, at the office, Colorado Springs, Col., April 4.

*Chicago & Alton*, annual meeting, at the office, Chicago, April 4.

*Joliet & Chicago*, annual meeting at office of Chicago & Alton, Chicago, April 4.

*Florida Railway & Navigation Co.*, annual meeting, at the office, Fernandina, Fla., March 15.

#### Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

*Lehigh Valley*, 1 per cent., quarterly, payable April 15.

*Manhattan*, 1½ per cent., payable on April 1.

*Sunbury & Lewistown*, 3 per cent., semi annual, payable April 1.

#### Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *National Association of General Passenger and Ticket Agents* will hold its half-yearly convention in Washington, on Tuesday, March 15

The *General Time Convention* will hold its spring meeting in New York City, on Wednesday, April 13.

The *Car Accountants' Association* will hold its annual convention in Atlanta, Ga., beginning on Tuesday, April 19.

The *Master Car-Builders' Club* holds its regular meetings at the rooms, No. 113 Liberty street, New York, on the third Thursday in each month.

The *New England Railroad Club* holds its regular meetings at its rooms in the Boston & Albany passenger station in Boston, on the second Wednesday of each month.

The *Western Railway Club* holds its regular meetings at its rooms in Chicago on the third Wednesday in each month.

The *Western Society of Engineers* holds its regular meetings at its hall, No. 15 Washington street, Chicago, at 7:30 p. m., on the first Tuesday of each month.

The *Association of North American Railroad Superintendents* will hold a meeting at the Hotel Brunswick, N. Y., on April 12.

The *International Car Accountants Association* will hold its annual convention at Atlanta, Ga., April 19.

#### New York Metal Exchange.

The annual meeting of the members for the purpose of receiving the reports of the Board of Managers and the Treasurer, and for the transaction of such other business connected with the affairs of the Association as may be presented, will be held at the Exchange on Wednesday, March 16, at 3 o'clock p. m.

The election of officers and managers will take place Monday, April 4; polls open from 11 a. m. to 2 p. m. At that time will be chosen a president, vice-president, treasurer, and fourteen managers, secretary, five members of the arbitration committee, and three inspectors of election, all to serve for the ensuing year. Each member of record will be entitled to vote in person or by proxy.

#### American Society of Mechanical Engineers.

A special preliminary notice of the spring meeting is issued as follows:

By a resolution of the Council, pursuant to the request and suggestion of a large number of the members, the fifteenth meeting of the Society will be held in the City of Washington, D. C., about the middle of May, 1887. The exact date and further details will be the subject of later announcements.

Papers for this meeting must be in the Secretary's hands before March 25, and titles should be sent on at once. It may be mentioned that fewer papers than usual have been so far contributed and promised, and the obligation is urged upon every member to see that our transactions are not allowed to deteriorate in value from his inaction. Topics are also solicited for the topical discussions at once. The Secretary will be glad to correspond immediately with members who have subjects to present.

#### Western Railway Club.

The next meeting of this club will be held in the Grand Pacific Hotel, Chicago, March 16, at 2 p. m. The subjects for discussion are: 1st. "Methods of Heating Cars," to be introduced by Mr. C. H. Mead. 2d. "Rules of Interchange of Cars," to be introduced by Mr. Wm. Forsyth.

Railroad men having views on the first subject are requested to communicate them in writing if they cannot attend the meeting.

#### Central Traffic Association.

The General Managers met in Chicago on March 8 to take up and consider the action of the Classification Committee in New York last week regarding the establishment of through rates between Western and seaboard points, and to agree upon a general policy for conforming with the new law. The meeting was an important one, and nearly every road in the association was represented. The action taken at the meeting in New York last week, by which a new classification was established and a new percentage basis adopted, was considered, and after some discussion approved and accepted

### ELECTIONS AND APPOINTMENTS.

*Atlanta & Charlotte.*—The directors are: Eugene Kelly, P. P. Dickinson, James H. Young, Richard Irvin, Jr., R. A. Lancaster, H. W. Sibley, James E. Grannis, B. R. McAlpin, S. Wilmer, J. H. Williams, J. W. Brown and W. N. Wilmer. H. W. Sibley was elected President, W. N. Wilmer Secretary, and George Sherman Treasurer.

*Atlantic Coast Line.*—This association is made up of the following lines: Richmond & Petersburg; Petersburg, Wilmington & Weldon; Wilmington, Columbia & Augusta; Albemarle & Raleigh; Midland of North Carolina; Northeastern of South Carolina; Central of South Carolina; Cheraw & Darlington and the Cheraw & Salisbury. The directors are: W. T. Walters, B. F. Newcomer, R. R. Bridgers, H. Walters, F. R. Scott, J. B. Palmer, A. F. Ravenel. The officers are William Walters, President, with office in Baltimore, Md.; John B. Palmer, 1st Vice-President, Richmond, Va.; Henry Walters, 2d Vice-President, with office at Wilmington, N. C.

*Buffalo, New York & Philadelphia.*—G. L. Taylorson has been appointed Traveling Engineer on the Rochester Division. The position is a new one, which gives Mr. Taylorson general supervision over all enginemen and engine supplies. F. J. Martin has been promoted to Trainmaster of the Rochester Division.

*Carrabassett & Canada.*—The incorporators of this proposed road in Maine are: J. R. Bodwell, of Hallowell; J. Manchester Hayes, Ira D. Sturgis, Selden Connor, Elias Millikin and M. V. B. Chase, of Augusta; E. Allen Field, of Sidney; J. U. Hubbard, L. D. Emmerson and G. T. Stevens, of Oakland; William Atkinson, Albert Moore, George B. Gray and Warren W. Pease, of Anson; John Cutts and Charles H. Clark, of New Portland; Solomon Stanley and John Winter, of Kingfield; Samuel W. Sargent and Varnum B. Mead, of Boston; Donald E. McFee, of Sherbrooke, Conn.; and James Ross, of Montreal.

*Central, of New Jersey.*—Mr. G. H. Griggs is appointed Superintendent of Motive Power of the Central and New Jersey Southern divisions, with office at Elizabethport, N. J

Mr. L. C. Brastow is appointed Superintendent of Motive Power of the Lehigh & Susquehanna Division, with office at Ashley, Pa.

*Chatham & Harwich.*—The stockholders of this new Massachusetts company have organized as follows: Directors, Alvin E. Atkins, of Chatham, Mass.; Lowell M. Palmer, of Boston; George D. Rice, of Cambridge; P. W. French, of Boston; James C. Elms, of Newton, Mass.; Ernest D. Blackwell, of Boston; George Godfrey, of Chatham; Edwin O. Childs, of Newton.

*Chesapeake & Nashville.*—John W. Radley has been appointed General Freight and Passenger Agent, Auditor and Cashier, with headquarters at Gallatin, Tenn.

*Chicago, Carolina & Northern.*—The officers are Gen. R. F. Hoke, of Raleigh, N. C., President; A. L. Hull, of Athens, Ga., Secretary and Treasurer; J. F. Morrison, of Athens, Chief Engineer; C. S. Dwight, of Winnsborough, S. Division Engineer; L. W. Perrin, Abbeville, S. C., Attorney.

*Chicago & Grand Trunk.*—At the annual meeting on March 9, the old Board of Directors was re-elected, except W. J. Spicer to succeed Judge Stanford, deceased, and R. Wright succeeding J. Herrick. The following officers were re-elected: Joseph Hixon, President; L. J. Sargent, Vice-President; Joseph Muir, Treasurer, and Charles Percy, Secretary.

*Chicago, Milwaukee & St. Paul.*—Mr. John O'Laughlin has been appointed Traveling Passenger Agent, with headquarters at Columbus, O. Mr. O'Laughlin's district includes the states of Ohio, West Virginia and Virginia, and the cities of Washington, D. C., and Baltimore, Md.

*Commercial Express Fast-Freight Line.*—J. A. Moore has been appointed general manager of this line, which operates over the Chicago & Grand Trunk, Detroit, Grand Haven & Milwaukee, Grand Trunk & Erie. Mr. Moore has headquarters at Buffalo, N. Y.

*Fergus Falls & Southern.*—The incorporators of this Minnesota company are Jacob Austin, G. O. Dahl, M. R. Viler, E. E. Corliss, W. J. Holmes, James A. Brown, C. O. Wheeler, C. Page, F. G. Barrows, of Fergus Falls, Minn.; Carroll E. Gray, Waukesha, Wis.; C. H. Graves and R. S. Munger, Duluth, Minn.

*Fitchburgh.*—John Quincy Adams, of Quincy, Mass.; David B. Kimball, of Boston, and James Renfrew, Jr., of Adams, Mass., were appointed by Gov. Ames State Directors of this road.

*Grand Rapids & Indiana.*—At the annual meeting the old board of directors was re elected, the only change being the choice of H. H. Houston, of Philadelphia, to succeed R. B. Potter, deceased.

*Great Eastern Fast Freight Line.*—R. Doyle has been appointed General Manager, with headquarters at Detroit, Mich.

*Gulf, Colorado & Santa Fe.*—The old board of directors has been re-elected as follows: Waller S. Davis, R. S. Wellis, George Sealy and Webster Snyder, of Galveston, Tex., and W. B. Strong, Isaac T. Burr and J. N. Nickerson, members of the Atchison, Topeka & Santa Fe and residents of Boston.

*Houston, Central Arkansas & Northern.*—The directors of the Arkansas Company are W. A. Bright, A. W. Files and Charles N. Night, of Little Rock, Ark.; James Converse, of San Antonio, Tex., and E. R. Morgan, of Kingston, Pa.

*Kansas City, Linn & Southern.*—The directors are Robert Kincaid, E. M. Adams, O. P. Watson, C. L. Long, B. B. Corbin, H. H. Woodruff, W. H. Broadwell, J. V. Donaldson, John Cross, James H. Rowe, T. J. Dowing and Charles Campbell.

*Louisville & Nashville.*—Office of Assistant Superintendent of Henderson Division has been abolished, and F. W. Forde has been assigned to other duties. The road from Nashville, Tenn., to St. Louis is now one division under the management of Mr. Metcalf, Superintendent, and J. C. Loomis, Assistant.

*Mexican Central.*—Mr. E. Rollins Morse has been elected to the vacancy in the directory caused by the resignation several months since of Charles J. Paine.

*Milwaukee, Lake Shore & Western.*—C. L. Wellington is General Freight Agent, with headquarters at Milwaukee, Wis.

*Minnesota & Northwestern.*—W. W. Stinnett has been appointed trainmaster of the second section, which includes the Waverly Branch. Mr. Stinnett has his headquarters at Dubuque, Ia.

*Missouri Pacific.*—Mr. H. M. Fickinger has been appointed Superintendent of the Kansas, Nebraska & Dakota, with headquarters at Fort Scott, Kan. Mr. L. Bartlett, Master Mechanic of the Missouri Pacific, and Samuel Irvin, Master Car-Builder, have their jurisdiction extended over the same road.

*New Company in Indiana.*—The directors of a new stock company just organized at Columbus, Ind., are J. D. Lyle, Samuel Hege, B. B. Jones, J. G. Schwartzkopf, Marshall Reeves, W. M. Graves, Richard Thomas and John Crump. The officers are Horace Scott, Louisville, Ky., President; J. N. Marsh, Secretary; E. F. Osborne, Treasurer.

*New Haven & Northampton.*—Mr. Robert G. Curtis will be Assistant to the Superintendent, which office is to be filled by President Yeamans.

*Niagara Falls & Whirlpool.*—The directors: Ensign Bennett, Josephus Collett, D. W. Fenton, Solomon Fenton, Jr., Norris Morey, Henry W. Sprague, Benjamin Fenton. The officers are: President, Ensign Bennett; Vice-President, Benjamin Fenton; Treasurer, Solomon Fenton, Jr.; Attorney, Norris Morey; Secretary, Alexander White; Inspectors of Election, Charles H. Keep, George F. Brownell, S. C. Baker.

*Niagara & San Jacinto.*—The directors of this new California company are: Thomas J. Daly, Henry A. Nelson, H. T. Christian, William H. Carlson and D. C. Reed. The officers are as follows: President, D. C. Reed; Treasurer, Thomas J. Daly; Secretary, Wm. H. Carlson.

*Norfolk & Western.*—Mr. J. G. Osborne has been appointed Train Master and Division Engineer of the New River Division, vice H. H. Handy, resigned.

*Paducah, St. Louis & Chicago.*—The incorporators are: E. C. Rice and G. W. Updike, of St. Louis, Mo.; Thomas Teketo, W. E. Beckwith and E. C. Rhodes, East St. Louis, Ill.

*Philadelphia, Marlford & Medford.*—The directors are George B. Roberts, Daniel M. Zimmerman, Edmund E. Reed, Wm. C. Huston, Benjamin Cooper, Elwood Evans, Joshua S. Wills, Crawford Miller, Charles J. Walton, Sr., Job Braddock, David D. Griscom. Officers: President, George B. Roberts; Secretary, David M. Zimmerman; Treasurer, Wm. Taylor.

*Peoria, Decatur & Evansville.*—Messrs. D. J. Mackey, Wm. Heilmar and C. C. Baldwin have been elected directors for three years; James M. De Vean and Herman Clark for two years, and H. J. Nichols for one year.

D. J. Mackey, President; William Heilman, Vice-President; Mr. Gambrill, Secretary.

*Peoria & St. Louis Air Line.*—The incorporators are: J. W. McNeely, Robert Hamilton, John A. Brahm, C. B. Laning, J. G. Strodtman and John Tice, of Petersburg, Ill.; E. W. Hayes, of Bunker Hill, Ill.; Thomas R. McKee, of Carlinville, Ill.; W. W. Brown, of Waverly, Ill.; D. C. White, of Forest City, Ill.; and John M. Palmer, of Springfield, Illinois.

*Richmond & Danville.*—The jurisdiction of the following officers of the Virginia Midland Division is extended over the Washington, Ohio & Western, recently consolidated: Col. Robert Andrews, Superintent; C. T. Dabney, Master of Transportation; F. I. Cabell, Engineer; H. M. Smith, Master Mechanic. Robert Bell, former Superintendent of the Washington, Ohio & Western, goes to the Richmond & Danville as Engineer of Maintenance of Way.

*St. Paul, Minneapolis & Manitoba.*—John A. Mayer is Superintendent of the Breckenridge Division in place of W. S. Kemp, resigned. Mr. Mayer's office will be at Minneapolis, Minn. C. Shields has been appointed Superintendent of the line west from Minot, Dak., which will be known as the Montana Division. Headquarters at Minot

Mr. E. J. Roberts has been appointed Chief Engineer during construction of the line between Minot, Dak., and Great Falls, Mont., with headquarters in the field.

*Solomon Valley, Gypsum & Gulf.*—The directors are Jonathan Tinkler and H. P. Jackson, of Gypsum City, Kan.; J. H. Brady, of Abilene, Kan.; A. Lewis, M. D., of Solomon City, Kan., and J. K. Osborne, M. D., of Bennington, Kan.

*Springfield & Southern Illinois.*—The directors are Edward Lane, Amos Miller, Wm. H. Brewer, Wm. Miller, A. McNeal, A. J. Gullich, Hillsboro, Ill.; C. D. Hoiles, Rufus N. Ramsay, Thos. Ford, Greenville, Ill.; Wm. H. Curtin, Carlyle, Ill.; Thos. B. Needles, Wm. S. Foreman, Col. Kringhoff, Nashville, Ill.; and Mr. Murphy, Perryville, Ill.

*Wabash, St. Louis & Pacific.*—Judge Cooley has appointed Judge George B. Burnett his attorney for the state of Illinois, with headquarters at East St. Louis.

*Wabash Western.*—This is the new organization succeeding to the Wabash, St. Louis & Pacific. O. D. Ashley, of New York, is President; A. A. Talmadge, Vice-President and General Manager.

Edgar T. Welles, Vice-President; James T. How, St. Louis, Secretary and Treasurer; William M. Beach, Assistant Secretary.

*Washington & Elberton.*—The stockholders elected the following directors at a meeting in Washington, Ga.: T. C. Hogin, T. B. Green, H. J. Hill, J. A. Bevson, M. M. Sims, J. M. Callan, F. H. Colley, M. P. Reese, R. T. Du Bose, B. S. Irvin, C. E. Smith, S. H. Hardeman and C. A. Alexander. The board of directors met afterwards and elected T. B. Green President, and C. E. Smith Vice-President.

## PERSONAL.

—Thomas E. Nash, of Wisconsin, has been appointed Superintendent of the United States Mail Service.

—Mr. Estus Lamb, President of the Providence & Worcester Railroad Company, died suddenly of apoplexy on March 9, at his residence in Providence, R. I.

—J. L. McGlone, of the Chesapeake & Ohio, has been appointed Private Secretary to Hon. J. S. Wise, President of the New York & Southern Telegraph Company.

—Emmons Blaine, son of James G. Blaine, has resigned his position as Freight Agent of the Chicago & Northwestern's Iowa Division, in order to enter journalism.

—N. M. Gidley, Freight Agent and General Yardmaster for the New York Central & Hudson River at West Albany, N. Y., died at his home in Schenectady, N. Y., last week. He had been in the company's employ for 25 years.

—Mr. George H. Griggs' appointment as Superintendent of Motive Power of the Central and Southern divisions of the Central New Jersey is one that is well deserved. His course during his service on the Erie and as Master Mechanic of the New York, Providence & Boston earned for him the respect of all who had relations with him.

—Jesse A. White, General Traveling Agent of the Newport News & Mississippi Valley, died suddenly at his home near Cincinnati, O., last Saturday. The Cincinnati and St. Louis papers are unusually eulogistic in their obituaries of Mr. White. It seems that he was a man liked by all who knew him. He was 39 years old and his business career had been passed in railroad service.

—Robert Garrett, the Baltimore & Ohio's President, gave another grand entertainment last week in his Baltimore residence. An exquisitely served dinner was followed by a reception. Among those present were Joseph Wharton, Wayne MacVeagh, of Philadelphia; Joseph Pulitzer, of New York; Samuel Sloan, of New York; Senator Don Cameron, the Hon. George M. Robeson, Senator Blackburn, of Kentucky; Senator Butler, of North Carolina; Austin Corbin, of New York; Alfred Sully, of New York; W. W. Corcoran, Washington; Charles De B. Keim, Philadelphia; George B. Roberts, President of the Pennsylvania Railroad, and Calvin Bruce, of New York.

—That Mr. W. H. Stevenson, who recently gave up his connection with the New York, New Haven & Hartford, is possessed of peculiarly attractive qualities, possibly of that very valuable one called "magnetism," would seem to be attested by the generous expressions of good will and affection which have been lately proffered him by the hard workers, the toilers, over whom he recently exercised supervision. In addition to the gifts of a week ago made by 400 employés of the New York Division, 50 engineers have given a banquet to Mr. Stevenson, and as a more lasting mark of their esteem, have presented him with solid silver tea and dinner services. The elegant gift was contained in a heavy, silver-bound cabinet of English oak. Mr. Stevenson is learning how good he is without the discouraging process of dying, an order of things unknown to the majority of railroad men.

## TRAFFIC AND EARNINGS.

### Southwestern, Western and Northwestern Passenger Associations.

These different passenger associations have agreed to sell mileage tickets as follows:

*Resolved*, That we will for the present continue their issue as an experiment upon the following conditions: That each ticket shall be restricted to use by the person whose name shall be entered upon the tickets and shall be non-transferable, and that they shall be sold at a uniform rate of no less than 2½c. per mile and without rebate; that each book shall be good for 1,000 miles, no more, no less, and its validity shall be limited to one year from date of sale. Baggage allowance to be the same as for regular travelers.

*Resolved*, That this agreement shall take effect at 1 p. m. to-day.

### Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

| *Month of February:* | 1887. | 1886. | Inc. or Dec. | P. c. |
|---|---|---|---|---|
| A'ton & T. H..... | $66,930 | $61,187 | I. $5,743 | 9.3 |
| Bur., C. R. & No. | 195,947 | 207 547 | D. 11,610 | 5.5 |
| Buff., N. Y. & P.. | 176,000 | 171.522 | I. 4,478 | 2.6 |
| Buff., R. & Pitts. | 116,222 | 113,191 | I. 3.031 | 2.8 |
| Cairo, V. & C..... | 49,080 | 39.560 | I. 9,520 | 24.0 |
| Canadian Pac.... | 501,000 | 485.458 | I. 15,542 | 3.2 |
| Chic. & Atlantic.. | 157,869 | 110,205 | I. 47,664 | 43.2 |
| Chic. & Alton.... | 589,009 | 541,394 | I. 47.615 | 8.7 |
| Chi. & East. Ill.. | 141,008 | 129,042 | I. 11,966 | 9.2 |
| Chi., Mil. & St. P. | 1,525,000 | 1,563,901 | D. 38,901 | 2.4 |
| Chi. & W. Mich.. | 91,419 | 92.142 | D. 723 | 0.7 |
| Cin., H. & Day... | 226,198 | 207,127 | I. 19,071 | 9.2 |
| Cin., H. V. & Tol.. | 295,954 | 256,954 | I. 49,000 | 31.2 |
| C., I., St. L. & C.. | 194,323 | 199.168 | D. 4,945 | 2.4 |
| Den. & R. G..... | 540,940 | 427,747 | I. 113.193 | 26.4 |
| Det., Lan. & No.. | 66,714 | 75,900 | D. 9,186 | 12.1 |
| Ev. & T. Haute.. | 53,544 | 50,288 | I. 3,256 | 6.4 |
| Ft. Worth & D.. | 35,102 | 25 932 | I. 9,170 | 35.4 |
| Ind., Bloom. & W. | 182,686 | 196 256 | D. 13,570 | 6.9 |
| Ind., St. Louis.... | 110,810 | 93,675 | I. 17,135 | 18 2 |
| Long Island..... | 153,691 | 138,119 | I. 15,572 | 11.2 |
| Lou. N. O. & T... | 172,225 | 137 820 | I. 34,405 | 24.8 |
| Louisv. & Nash.. | 1,165,690 | 1,050,103 | I. 115,587 | 11.0 |
| Lou., N. A. & C. | 144,620 | 113,482 | I. 31,138 | 27.4 |
| St. P., M. & Man. | 434,809 | 425,294 | I. 9,515 | 2.2 |
| Manhattan ..... | 596,420 | 547,568 | I. 48,852 | 8.9 |
| Mexican Central | 388,249 | 277,581 | I. 110,659 | 39.8 |
| Mexican National. | 85,867 | 72,703 | I. 13,164 | 18.1 |
| Mil., L. S. & W.. | 158,554 | 100,532 | I. 58 022 | 57.7 |
| Mil & Northern.. | 64,360 | 45 488 | I. 18.872 | 41.4 |
| Mobile & Ohio ... | 200,499 | 167,139 | I. 33,360 | 19.9 |
| N. Y. City & No.. | 41 357 | 35.986 | I. 5.371 | 14.9 |
| N., Y. Ont. & W.. | 85,594 | 76,504 | I. 9.045 | 11.8 |
| Norfolk & West.. | 276,592 | 203,771 | I. 72.821 | 35.7 |
| Northern Pacific.. | 514,560 | 594,240 | D. 79,680 | 13.4 |
| Ohio Southern.... | 45,928 | 43.979 | I. 1.949 | 4 8 |
| Peoria, Dec. & E.. | 62,671 | 60.488 | I. 2.183 | 3.5 |
| St. L., A. & Tex... | 162,455 | 138,280 | I. 24,175 | 17.4 |
| St. Jo. & Gd. I.. | 74,289 | 113.016 | D. 38,187 | 33.7 |
| St. L. & San F... | 397,079 | 302,605 | I. 94,474 | 31.2 |
| St. P. & Duluth.. | 81,355 | 67,385 | I. 13.970 | 20.7 |
| Tol. & Ohio Cent. | 77,580 | 51,634 | I. 25.946 | 50.2 |
| Vera Cruz ..... | 355,482 | 297,162 | I. 58,320 | 19.6 |
| Wisconsin Cent .. | 118,048 | 92,807 | I. 25,241 | 27.1 |
| Wab., St. L. & P. | 431 988 | 449,905 | D. 17,917 | 3.9 |
| Total ..... | $11,516,093 | $10,515,787 | I. $964,306 | 9.1 |
| *Month of January:* | | | | |
| South Carolina .. | $98,132 | $94,375 | I. $3,757 | 3 9 |
| Gr. B., W. & St P. | 30,710 | 18,965 | I. 11,745 | 61.7 |
| Total..... | $128,842 | $113,340 | I. $15,502 | 13.6 |

Early reports of monthly earnings are usually estimated in part, and are subject to correction by later statements.

### Coal.

Coal tonnages for the week ending March 5 are reported as follows:

| | 1887. | 1886. | Inc. or Dec. | P.c. |
|---|---|---|---|---|
| Anthracite..... .... | 648,146 | 540,165 | I. 107,981 | 19.9 |
| Bituminous..... ..... | 290,032 | 236,733 | I. 53,299 | 22.5 |
| Coke (Feb. 26)..... | 82,702 | 36,741 | I. 45,961 | 125.0 |

Cumberland coal shipments for the week ending March 5 were 57,855 tons; total to March 5 for the year, 481,307, an increase of 121,660 tons, as compared with the corresponding period last year.

The coal tonnage of the Pennsylvania road for the week ending Feb. 26 was:

| | Coal | Coke | Total. | 1886. |
|---|---|---|---|---|
| Line of road..... | 163,243 | 80,908 | 244,151 | 268 770 |
| From other lines.. | 72,774 | 1,794 | 74,568 | 36,741 |
| Total..... .. | 236,017 | 82,702 | 318,719 | 305,511 |
| Year to Feb. 26... | 2,014,205 | 710,715 | 2,724,920 | 2,270,182 |

Increase for the week, 13,208 tons, or 4.3 per cent.; increase for the year, 454,738 tons, or 20 per cent.

### Cotton.

Cotton movement for the week ending March 4 is reported as below, in bales:

| *Interior markets:* | 1887. | 1886. | Inc. or Dec. | P. c. |
|---|---|---|---|---|
| Receipts..... .... .... | 38 062 | 43,148 | D. 5,086 | 11.7 |
| Shipments..... ... | 73.270 | 43,346 | I. 29 924 | 69.0 |
| Stock, March 4..... | 265,991 | 442,408 | D. 176,417 | 39.8 |
| *Seaports:* | | | | |
| Receipts.. . ..... | 79,951 | 68,223 | I. 11.728 | 17.1 |
| Exports ... . ..... | 126,363 | 82,094 | I. 44.269 | 53.9 |
| Stock, March 4 ..... | 797,419 | 985,917 | D. 188.498 | 19.1 |

The total movement from plantations for the crop year ending March 4 was 5,947,349 bales, against 5,855,994 last year, 5,310,646 in 1884–85, and 5,229,715 in 1883–84.

### Southwestern Railroad Association Shipments.

The shipments during the year 1886 of west-bound freight amounted to 947,862 tons, and those of east-bound freight to 872,113 tons; total, 1,819,975 tons. The earnings from west-bound traffic amounted to $5,082,342, and those from east-bound traffic to $3,561,376, a total of $8,643,718.

### Restoring Traffic Rates.

The associated roads of Kentucky, Alabama and Tennessee have agreed to restore full tariff rates. Each road violating the agreement is to forfeit $10,000 in addition to the $5,000 exacted by the Inter-state Commerce bill.

### Central Traffic Association.

Arbitrator Samuel Stevens has decided that the following passenger rates from St. Louis to New York shall be charged until a general revision in rates can be made:

"Vandalia—$23.50 first-class, $20 second-class.

"Cleveland, Columbus, Cincinnati & Indianapolis—$22.50 first-class, $20 second-class.

"Ohio & Mississippi—$21.50 first-class, $20 second-class.

"Wabash, St. Louis & Pacific—$21.50 first class, $20 second-class.

"Chesapeake & Ohio, via Louisville or Cincinnati—$20.50 first-class, $19 second-class."

### Northwestern Passenger Association.

The new award of percentages has appeared. The award on east and west bound revenue was made by General Manager C. H. Chappell, of the Chicago & Alton, and Commissioner J. H. Ridgley. It is as follows: Chicago, Milwaukee & St. Paul, 26 per cent.; Chicago & Northwestern, 22½; Chicago & Rock Island, 16; Chicago, Burlington & Quincy, 15; Burlington, Cedar Rapids & Northern, ½; Central, of Iowa, ½; Illinois Central, 5; Rock Island & Peoria, ½; St. Louis, Kansas & Northwestern, 2½; Wisconsin Central, 9; Wabash, St. Louis & Pacific, 2½. For the south or east bound the award was made by J. H. Hiland and C. H. Chappell. These percentages are: Chicago, Milwaukee & St. Paul, 26½; Chicago, St. Paul, Minneapolis &

Omaha, 21; Chicago, Burlington & Northern, 15; Minnesota & Northwestern, 12½; Minneapolis & St. Louis, 16; Wisconsin Central, 9.

### Railway Accounts Against the United States.

Mr. S. Guthrie, of Washington, D. C., has issued a pamphlet giving a list of the departments, bureaus and offices of the general government which may require transportation, and forms of vouchers to be used in rendering accounts against them. The settlement of such accounts has come to be expert work of a pretty high class, requiring a great amount of special knowledge, and the need has called into existence a new profession.

### Transcontinental Railroad Managers' Conference.

A conference of the transcontinental railroad managers was held last week in the office of the Northern Pacific, at New York. The roads represented were the Central Pacific, Union Pacific, Northern Pacific, Atchison, Topeka & Santa Fe and Southern Pacific. These were represented by Presidents C. F. Adams, Robert Harris, C. P. Huntington, Charles F. Croaker, W. B. Strong and J. Gould, with Traffic Managers Kimball, Towne and Calloway. The vice-presidents of some of the roads were also present, and Counsellors Gray of the Northern Pacific, Dillon of the Union Pacific and Tweed of Southern Pacific. The conference discussed the questions, first, as to the requirements of the Inter-state Commerce bills; second, how the transcontinental roads can get into harmony with the law and meet the demands of public sentiment.

The result of their deliberations was that two tariffs for freight and passenger business should be prepared, one under the long haul clause and the other under the short haul clause, as they are understood by the railroads. These tariffs are to take effect April 5, and are to be submitted to the inter-state commerce commissioners within a reasonable time after their appointment is announced.

### Transportation in Congress.

Among the acts authorizing corporations to bridge navigable waters were the following: To the St. Louis Merchants' Bridge Co., over the Mississippi River near St Louis; to the St. Paul & Duluth Railroad Co., over the St. Louis River between Minnesota and Wisconsin; to the Ohio Valley Railroad Co., over the Trade Water River; to the East Dubuque Bridge Co., over the Mississippi River; to the state of Mississippi, over Bayou Baranard; across the Potomac River at Washington, D. C.; across the Missouri River between Kansas City and Sibley, Mo.; across the Cumberland River near Davidson, Tenn.; across East River between New York and Long Island; across the Great Kanawha River below the falls; across the Missouri River between Omaha and Council Bluffs; across the Mississippi River near Winona, Minn.; across the Missouri River at Pierre, Dak.; across the Tennessee River near Mussels Shoals Canal; across the Tennessee River near Guntersville, Ala.; across the Mississippi River near Keokuk.

Among the rights of way granted railroad corporations were the following: To the Mari opee & Phœnix Railroad Co. through the Gala River Indian Reservation; to the Rio Grande & El Paso Railroad Co. through the Fort Bliss military reservation; to the St. Paul, Minneapolis & Manitoba Railroad Co. through the Indian reservation in Northern Montana and Northwestern Dakota; to the Fort Worth & Denver City Railroad Co. through Indian Territory; to the Fremont, Elkhorn & Missouri Valley Railroad Co. across the Fort Meade military reservation; to the Utah Midland Railroad Co. through the Uncompahgre and Uintah Reservation in Utah; to the Rocky Fork & Cooke City Railroad Co. through the Crow Indian Reservation in Montana

## OLD AND NEW ROADS.

**Annapolis & Baltimore Short Line.**—This road opened for regular passenger and freight traffic on March 9. Three passenger trains will be run each way between the cities on week days and two on Sundays. The length of road will be 25 miles when several miles more are built. The route for the present is over the Curtis Bay Branch of the Baltimore & Ohio to the junction with the Short Line road at Clifford's Station, Md. The opening of the road for traffic has occurred a month earlier than was contemplated.

**Atchison, Topeka & Santa Fe.**—The New York *Mail and Express* has printed a statement saying that this road wishes to cross New Jersey and the Arthur Kill to Staten Island, and in that way get into New York. It says that the Baltimore & Ohio is in the secret. Maps and plans have been prepared and arrangements have been made for obtaining the necessary terminal facilities from the Staten Island Rapid Transit Co. Where the road will enter New Jersey is not known, but it will not be by the way of Philadelphia. It is stated that the road will have to lay several miles of new track of its own, though it will use the Baltimore & Ohio's as far as possible, and will use the latter's bridge across the Kill. The Atchison, Topeka & Santa Fe has arranged to start traffic to and from New York by May, 1888. Surveyors have been secretly at work for several weeks past, and it is alleged that the views of the Legislature have been tapped to some extent.

Colonel J. E. McIntire, of Buffalo, N. Y., has been given the contract for building over 200 miles of this company's extension from Kansas City, Mo., to the Mississippi River.

**Atlantic, Tennessee & Ohio.**—This road is to be extended from Statesville, N. C., to Taylorsville, 20 miles, and 21 car loads of iron have been delivered at Statesville for the purpose.

**Baltimore, Grafton & Charleston.**—A charter has been granted to this company for a road to commence at a point on the line of the Grafton and Greenbrier road, near the Buchanon River, in Barbour County, West Virginia, and to run from there to the city of Charleston, Kanawha County.

**Baltimore & Ohio.**—At the time of going to press there seems to be no doubt that the controlling (Garrett) interest in the stock of this company has been secured by a gigantic syndicate. Rumor seems to be settling down to Messrs. Alfred Sully, Austin Corbin, Brice and Thomas as purchasers. The terms of the sale and its objects and bearings are purely conjectural.

Of the 150,000 shares of the company Johns Hopkins University owns 17,000 shares subject to control of the Trustees of the University. The late President, John W. Garrett, placed 30,000 shares in such a way that it cannot be marketed. The city of Baltimore owns 32,000 shares, which are not likely to be sold. While the shares left in trust by the late John W. Garrett, cannot be sold, the right to vote upon them may be.

The Baltimore & Ohio system of roads includes 2,592.27 miles of track. Of these 840½ are on the main stem. Of actual lines of road the system controls 1,695.54 miles thus distributed: Baltimore to Wheeling, W. Va., 379 miles; branch lines owned, 75.75 miles; branch lines leased, 113¼ miles; other lines controlled through lease or ownership, 1,038.04 miles; other lines operated, 86¼ miles; Ohio River bridges, 3 miles. The Philadelphia & Reading system includes 365.5 miles of track on its main line and 443.8 miles of branches, making a total of 809.3 miles owned. Including the Jersey Central's tracks, until recently in its possession, the Philadelphia & Reading controlled of leased lines 2,125.1 miles, and 136.9 miles more under its control without lease. The aggregate miles of track in its charge footed up 3,071.3.

The main line of the Central Railroad of New Jersey extends from Jersey City to Phillipsburg, N. J., a distance of 72.3 miles. Together with its branches it makes up a total of 98.7 miles. Of second track it has 82.7 miles, and of sidings 145 8 miles, making in all 327.2 miles. Through leases and otherwise it controls 650.23 miles more. In this way the Jersey Central system includes 977.43 miles.

In the Richmond Terminal system (including the Richmond & Danville property and the lines of the East Tennessee, Virginia & Georgia) there are 6,500 miles of track operated.

An executive order has been issued giving instruction to limit to April 5 the date on which the Inter-state law goes into effect, all passes which may hereafter be issued, except those to employés of the Baltimore & Ohio or to officers and employés of other railroad companies, in exchange for similar courtesies.

A survey is in progress for a new branch running from the new line between Philadelphia and Baltimore to Cambridge, Md.

**Bell's Gap.**—A new road is being graded from Newburgh, Cumberland County, Pa., on the above-named road, to Taylor Station on the Ebensburgh branch of the Pennsylvania. The road will develop an extensive coal field.

**Blue Spring, Orange City & Atlantic.**—This new road, which extends from Blue Spring to New Smyrna, in Florida, about 20 miles, was opened on March 8, with an enthusiastic celebration by interested Floridians.

**Boston & Lowell.**—The company is considering a plan to tunnel a portion of Boston, including Beacon Hill and the Common, and to build two new stations, one in the down-town business section and the other up nearer the centre of the city. Under this plan electricity is likely to become the motive power of the road in Boston.

**Buffalo, New York & Philadelphia.**—The New York & Cleveland Gas Coal Co. has brought action against the above named railroad company and its Receiver, G. Clinton Gardner, to restrain them from carrying out their intentions of ceasing to transport the coal company's cars and coal after a certain date. The case is being considered by Sussex L. Davis, of Philadelphia, as Master.

**Buffalo, Rochester & Pittsburgh.**—Judge Garry, in the Elk County, Pa., Court, has rendered a decision removing Tutlow Jackson from the Receivership of this road and confirming the sale of the entire line to Adrian Iselin, of New York. Two years ago the company defaulted on payment of interest upon first mortgage bonds and the mortgage was foreclosed. At the sale Mr. Iselin bought it. A number of dissenting stockholders brought suit to have the foreclosure set aside. The case was brought before the Pennsylvania Court and a Receiver was appointed for the Pennsylvania end of the line. Mr. Iselin appealed the case for the reorganized company. The opinion of the Court now is "that the sale and amended decree in New York vested a valid title in Adrian Iselin to the Buffalo, Rochester & Pittsburgh Railway in both states. The bill to be dismissed at the cost of the defendants." This ends the suit between the two factions, which has been contested for nearly three years.

**Buffalo & Williamsville.**—This company has a charter for a road to run between Buffalo and Williamsville, about 10 miles. A proposition has been made—and it is likely to be acted upon—to the Rome, Watertown & Ogdensburg to build an extension from Olcott, Niagara County, on Lake Ontario, down to Williamsville, to connect with the proposed new road, and thus gain entrance into Buffalo.

**Canadian Pacific.**—The British government has decided to subsidize, to the extent of $50,000 a year, the new line of steamers which this railroad company will operate between Vancouver, B. C., Hong Kong and the East. Sir George Stephens, President of the Canadian Pacific, is now in London making arrangements for the establishment of the line.

**Carrabassett & Canada.**—The Railroad Committee of the Maine Legislature will report favorably a bill to charter a road from North Anson, Somerset County, Me., to connect with the Somerset road, thence through the towns of New Portland and Kingfield, following up the Carrabassett Valley, thence by the best route to the town of Eustis on the north branch of the Dead River, and from there to the Canada line.

**Central Missouri.**—There is a project to build a line from Alton, Ill., to Kansas City, Mo., starting from a point in Missouri, on the river opposite Alton, and running through the counties of Jackson, Johnson, Lafayette, Pettis, Saline, Cooper, Howard, Boone, Calloway, Montgomery, Warren and St. Charles to Kansas City, the distance being nearly 300 miles, with a branch line to Hannibal, Mo., 95 miles long. The Central Missouri controls the charter for a bridge across the Missouri at Alton, and, through its purchase of the Kansas City Short Line, also controls a charter for a bridge across the Missouri at St. Charles, Mo.

**Central Vermont.**—A contract has been made with the Vermont Construction Co. of St. Albans, Vt., to put up an iron bridge to replace the one destroyed at White River Junction, Conn., on Feb. 5. It is to be of 5 spans, 650 ft. long, of the riveted lattice system, and 475 tons of iron will be used in its construction. It is to be a "deck bridge" with safety guards of a new device.

Counsel has brought suit for Mary Murphy against the railroad company for $20,000 damages for personal injuries received in the White River disaster.

**Chatham & Harwich.**—This new road between Chatham and Harwich Depot, in Barnstable County, Mass., is to be 7 miles in length, and work upon it is to begin immediately. The capital stock is $70,000.

**Chattanooga & Southeastern.**—The city of Chattanooga, Tenn., has voted $100,000 to this road from Chattanooga to Rome, Ga., to connect with the Rome & Carrollton, now built from Rome to Cedartown. This insures the road between Chattanooga and Rome.

**Chicago, Burlington & Quincy.**—A statement—which has been denied by the road's representatives—has been made to the effect that the South Pacific Coast road has been bought by the above company. The coast road is a narrow gauge line from San Francisco to Santa Cruz, Cal., and is controlled by Senator James G. Fair.

This company has in progress a revision of its code of rules, and very sensibly includes enginemen and conductors in the committee of revision.

**Chicago & Indiana Coal Co.**—A branch is nearly completed to a connection with the Evansville & Indianapolis system, making another through route from Lake Michigan to the Ohio River. A traffic arrangement has been made for the use of a small portion of the Chicago & West Michigan tracks near La Crosse.

**Chicago, Kansas & Nebraska.**—A Chicago contracting firm will build shops for this company at the new town of Horton, in Brown County, Kan. The cost will be about $250,000, and work will begin at once.

**Chicago, Milwaukee & St. Paul.**—The new freight house of this company, situated at the east end of the Kinzie street bridge, is a large two-story and basement structure, built of white brick, and has by far the greatest storage capacity of any freight house in the West. It is also the only three-story building of its kind in the United States. To utilize the three floors the company have placed six elevators near the west side of the building. Three of these elevators are the ordinary platform freight elevators, but of extra size, the platforms being 15 ft. square, and having a lifting power of over 8 tons, each elevator lifting 75 barrels of flour at one load. The most novel feature of the machinery is the barrel and package elevators built by the Link Belt Machinery Co., of Chicago. These elevators are so built that they automatically raise and lower barrels and packages, at the same time loading and unloading at any floor by a most ingenious device. They have a combined capacity of over 15,000 barrels and packages in a day of 10 hours. The house will be opened for business about April 1.

A contract has been made to extend the road northward in Michigan 50 miles toward Lake Superior.

**Chicago, St. Paul, Minneapolis & Omaha.**—The road near Saint James, Minn., was completely buried in snow and ice all last week. A force of 115 men was put at work in the cut near that point, while 3 miles east of Brigham Lake, 300 men had to pick their way through solid ice.

**Cincinnati, Hamilton & Dayton.**—The Baltimore & Ohio Express Co. has formed a connection with the above company by which their business is extended over 400 miles of new territory.

**Cincinnati, Jackson & Mackinac.**—This is the name of the company which will operate the Michigan & Ohio. The latter road has been turned over to its purchasers by Receiver Bradbury. Headquarters will be at Van Wert, O. A new line is to be built from Toledo, O., to Dundee, and the Toledo, St. Louis & Kansas City road will be used to connect with the main line for Cincinnati.

**Cleveland & Canton.**—The stockholders who are opposed to the Blood management held an informal meeting in Boston last week. Austin Corbin said that the road could be made a valuable property if the gauge was widened and proper connections were made with other lines. He also said that the Blood party had no right to the management of the road, as they do not represent a majority of the stockholders. Mr. Roach spoke in defense of the Blood faction and said that the present board was elected by a large majority. He suggested that it would be good policy on the part of all concerned in the welfare of the road if they would come together and work harmoniously to raise the necessary funds for widening the gauge and reducing expenses.

**Colorado Midland.**—The company has contracted for 25 locomotives, 35 passenger coaches and 1,000 other cars.

**Dayton & Ironton.**—The change to standard gauge is to be made on Sunday, April 3, with a large force of men from other roads employed to assist in the work. Before widening the gauge, the company is trying to obtain an entrance into Ironton, O., by some other way than over the Iron road's tracks. It is said that the Dayton & Ohio have made an unsatisfactory effort to buy the Iron road, $600,000, the price asked, proving too high a figure.

**Denver & Rio Grande.**—A large construction force is grading the new roadbed between Grand Cañon and Salida, Col. In one place a tunnel of three or four hundred feet is to be made.

**Des Moines & Fort Dodge.**—The road will be built to Council Bluffs, Ia., during the present year. The engineer corps is in the field locating the line, and has reached Templeton, 75 miles from Council Bluffs. Terminal facilities in the latter city are being negotiated for now.

**Des Moines & Northwestern.**—Gen. G. M. Dodge, of New York, and Polk & Hubbell, of Des Moines, Ia., have bought this road from the Wabash, St. Louis & Pacific Co. It is a narrow-gauge line extending from Des Moines to Fonda, northwest, 90 miles, and it will be widened to standard gauge and be extended to Sioux City, Ia.

**Emporia, Winfield & Fort Scott.**—The company has received a charter at Topeka, Kan. A road will be built from a point in Lyon County through Lyon, Chase, Greenwood, Butler and Cowley counties, to the south line of the state, thence through the Indian territory and Arkansas to Fort Smith, Ark. The total length of the road will be 375 miles, and the capital stock $5,000,000.

**Eufaula & St. Andrew's Bay.**—This company has purchased of Col. W. D. Chipley, Vice-President of the Pensacola & Atlantic, 150,000 acres of the latter company's land adjacent to St. Andrew's Bay, Washington County, Fla.

**Fargo, Grand Forks & Pembina.**—Articles filed in Dakota for the purpose of building a line from Fargo to Pembina, 150 miles.

**Fergus Falls & Southern.**—Incorporated in Minnesota, and will build a road from Fergus Falls north to Duluth, Minn. It will cross the Northern Pacific road. Principal office, Fergus Falls, Minn.

**Fort Worth & Denver City.**—The track is completed to Quanah, Tex., from Fort Worth, 193 miles, and trains are now running. Tracklaying continues beyond Quanah, and the grading forces cover some 60 miles.

**Georgia, Carolina & Northern.**—This company is the successor of the Chester, Greenwood & Abbeville, and proposes to build a standard a gauge road from Monroe, N. C. to Atlanta, Ga., via Chester, Clinton, Greenwood and Abbeville in South Carolina and Elbenton and Athens in Georgia. The line will be between 260 and 270 miles long. Four corps of engineers are now in the field, two in South Carolina and two in Georgia. The contracts will soon be let, and construction be pushed to an early completion.

**Hartford & Connecticut Western.**—Under the management of the new controlling parties, the extension of this line to connection with the West will be commenced at once. The road will cross the New York, Ontario & Western, the New York, Susquehanna & Western, Lehigh Valley, Central of New Jersey and the Philadelphia & Reading.

**Hightstown & Pemberton.**—A Passenger train leaving Hightstown, N. J., for Philadelphia, on Tuesday last, was thrown from the track by a broken rail about three miles from the town. The mail and baggage cars took fire immediately from the stoves. The mail agent, Alfred A. Perrine, was burned to death. Five other persons were injured.

**Houston, Central Arkansas & Northern.**—Incorporation articles have been filed at Little Rock, Ark. The

road will begin at or near Pine Bluff, Ark., and run southward through Jefferson, Drew, Lincoln and Ashley counties to a point on the Louisiana State line, a distance of 90 miles. Capital stock is $450,000.

**Hudson Bay.**—A correspondent of *Engineering*, writing from Ottawa at the end of January, states that the Hudson Bay Railway enterprise is daily gaining ground. The latest news that had been received at Ottawa was that the first steamship to ply on the new ocean route which the railway will open had been launched and named Port Augusta. She is a steel-plated vessel of 3,000 tons, specially built for the new trade, and will have accommodation for 1,000 passengers. A sister ship, the Port Nelson, will be launched in the month of March, and two other steamers are being fitted out—the Maharajah and Sir Richard Corry. The first voyage is to be made in the early part of June, as an experimental trip, and the vessel will take out a cargo of rails, of which some 2,000 tons are waiting shipment. It is stated that if the provincial guarantee is adopted by the Manitoba Legislature satisfactorily to British capitalists, an additional 200 miles of railway will be constructed during the ensuing summer.

**Illinois Central.**—The litigation involving this company's claim to the harbor front of Chicago came up before Judge Gresham last week. The railroad company has been filling in along the lake shore bordering its tracks, and injunction proceedings were begun some time ago, but were dropped on promises that the company would cease operations. When the new restraining order was asked of Judge Gresham last week, John Jewett, in behalf of the railroad company, opposed the motion, saying that the Illinois Central wished the case heard by Judge Blodgett and not by Judge Gresham. This was something in the nature of an insult to the Court. Judge Gresham said he would have nothing to do with the case. He said that nothing could be more offensive to a judge than to be told in so many words that any one feared he would not try the case fairly. He will not touch this case.

This company has bought property at Rockford, Ill., as follows: $50,000 to ex-Mayor Tinker, for railroad grounds; $25,000 to Emerson, Talcott & Co., for yard purposes; $11,000 to J. H. Jones, for right of way, and $10,000 to W. L. Harbison for land for tracks.

This company has given notice of its withdrawal from all pools. This action affects all the Western, Southwestern and Northern pools.

The company proposes building a branch from Clinton, Ill., to Leroy, about 18 miles, in order to give its recent purchase, the Havana, Rantoul & Western, a direct connection with its own system.

**Kansas City, Fort Scott, Memphis & Birmingham.**—The projectors contemplate building an extension from Selma, Ala., to Pensacola, Fla. Two vessel loads of railroad iron have been discharged recently at Pensacola.

**Kansas City, Linn & Southern.**—Incorporated at Mound City, Kan. The proposed road will run from Kansas City, Mo., through Jackson and Cass counties in Missouri, and Johnson, Miami, Linn and Bourbon counties in Kansas, and then in a southeasterly direction through Missouri and Arkansas to a point on the Missouri River. Estimated length of road, 500 miles. Capital stock, $8,000,000.

**Lake Erie, Essex & Detroit River.**—The question of granting a bonus to this proposed road has been defeated by the township of Gosfield, Mich., but the company will continue with construction, as it has been granted a government subsidy of $3,200 per mile, and instead of a bonus expects to secure free right of way through Gosfield township.

**Lake Shore & Michigan Southern.**—The Circuit Court at Cleveland, O., has sustained the judgment of the lower court in the case of Scofield, Shermer & Teagle against the above company. The plaintiffs are oil refiners who charged that the railroad discriminated in freight rates in favor of the Standard Oil Co. They received a verdict of $4,000 actual damages and $1,000 punitive damages.

**Louisville & Nashville.**—The company is extending its Bardstown branch from Bardstown to Springfield, Ky., 22 miles, and the Nashville & Florence from St. Joseph, Ala., to Florence and Sheffield, 25 miles. A branch is being built up the Cumberland Valley from Corbin, Ky., to Pineville, Ky., about 30 miles, and one from Clarkeville, Tenn., to Princeton, Ky., 57 miles.

The company has recently contracted for 23 locomotives and 500 cars. Several branches, which will give 122 miles of new road, are now being built.

The statement for seven months ending Jan. 31 is as follows:

| | 1886-87 | 1885-86. | Inc. or Dec. | P. c. |
|---|---|---|---|---|
| Earnings..... | $8,891,281 | $7,892,603 | I. $998,678 | 12.6 |
| Expenses..... | 5,220,837 | 4,829,841 | I. 390 996 | 8.0 |
| Net earnings..... | $3,670,444 | $3,062,762 | I. $607,682 | 19.8 |

**Louisville, St. Louis & Texas.**—Contract for the grading of the line from West Point, Ky., to Stephensport, Ky., has been let, and 300 men will be at work on the section by the first of April.

**Lehigh Valley.**—The connecting link between Whitehaven and Hazleton, Luzerne County, Pa., is fast being completed. The Harvey Creek Road, from Kington to the North Mountain summer resort, is ready for operation, having been completed two weeks ago. This road will eventually be extended to Wilkes-Barre, connecting there with the Lehigh Valley's main line. Engineers are surveying a new line from Allentown to Macungie, Lehigh County, situated along the East Pennsylvania, and it is thought the road will be completed during the coming summer. It will be about 9 miles in length.

It is reported that this company has bought control of a coal tract of about 1,000 acres in Kingston township, Luzerne County, Pa. The amount paid is said to be about $1,500,000, together with a royalty of from 3 to 4 per cent., according to the price of coal. There are two large collieries on the property, with 1,500 employés.

**Manhattan.**—An accident of an unprecedented nature occurred on the Third Avenue Elevated road at the 14th Street station, New York, on the morning of March 8. Owing to a fire on the Bowery, all down trains were kept waiting in a long line. Several workingmen became impatient at the delay, and, with or without the knowledge of the guard, about thirty of them climbed from the train down to the narrow walk which skirts the tracks just above the station, intending to walk the short distance and thus gain the platform. The walk was very slippery, and can be safely used only by calm and experienced men. While it was occupied by the crowd of men on this occasion, the engineer of the train ahead started his engine. A man who was just climbing from the train attempted to get back again, but stuck in his position with the lower half of his body extending over the narrow walk. The men on the walk became confused and scrambled forward toward the station to avoid being struck by the projecting legs of the man on the train. Huddled together, the men lost all presence of mind, clutched frantically at one another, and the result was that ten of them fell to the stone pavement. Four were killed almost instantly. Six were injured, and some of these latter will probably die.

**Marietta & North Georgia.**—It is reported that this company will build a ten-mile branch from Dickey's, in Fannin County, Ga., to the Ducktown copper mines, and that the mines, which have not been worked for many years, will be set going again.

**Mayville & Westfield.**—The contract for grading the new road between Mayville and Westfield, Chautauqua County, N. Y., is said to have been let to Contractor Casement, of Painesville, O.

**Mexican Central.**—It is said that President Palmer is at the head of a movement now going forward toward consolidating the narrow gauge roads in the southwest and Mexico into one great system. The roads interested are the Mexican National, the Southern Pacific Coast Narrow Gauge, the Denver and Rio Grande and the Texas, Santa Fe & Northern. The latter, it is alleged, will be extended south to El Paso, there to meet the Mexican National and link it with the Denver & Rio Grande, while the last named road will build a branch to make a connection with the Southern Pacific Coast Narrow Gauge. President Palmer is now in London raising funds for extending the Denver & Rio Grande across Utah to Santa Cruz, and building the Mexican National, north from Laredo, Mexico, to connect with the Texas, Houston & Northern at El Paso.

**Mexican National.**—An agreement has been reached with the Mexican Central, whereby both companies are to build their Pacific extensions as originally planned. Engineers are already in the field for the National's line, which will be run within about 4 miles of Guadalajara. Entrance to the city will be made by a branch.

D. C. Dodge, Vice-President of this company, has been to Laredo, Mex., to buy real estate and superintend the commencement of the new international bridge at that point.

**Metropolitan Transit Co.**—George Bliss, of New York, appeared before the Senate Railroad Committee, at Albany, N. Y., this week, and made an argument in favor of Senator Plunkitt's bill, which gives the above-named company the right to build an elevated road on Broadway, N. Y. The charter for this road was obtained in 1872. The committee has postponed action on the bill until next week.

**Michigan Central.**—The contract for the new passenger station, freight depot and roundhouse to be built at London, Ont., has been given to Alonzo Ellison, of St. Thomas, Ont.

**Missouri Pacific.**—The Kansas & Colorado has been completed west to McCracken, Kan.

**Minnesota & Northwestern.**—This company proposes to build between St. Paul and Minneapolis. The road will run so as to give an entrance to Minneapolis for freight handling on the south bank of the Mississippi.

**Morris & Essex.**—The bill to repeal this company's charter is now before the New Jersey Legislature, and the fight over it promises to be a sharp one. When the charter of the Morris & Essex was granted fifty years ago, a clause was inserted by which the company was to submit to taxation when it paid a dividend of 7 per cent. A money dividend to that amount was never paid until eighteen years ago, when the company passed into the hands of the Delaware, Lackawanna & Western. During a period of over thirty years, therefore, the company escaped all taxation. When the lease was made a clause was inserted to the effect that the road should pay a tax of one-half of 1 per cent. upon its cost value. The Delaware, Lackawanna & Western paid this tax yearly to the state, or part of it, but in 1877 the right of the state to change the system was mooted and the case went before the courts. The New Jersey judges sustained the state, but in a case before the United States Supreme Court the claim that the act giving the state's consent to the lease formed an inviolable contract was set up, and the Court upheld it. As a consequence the company made no change and has since paid in the old way. In 1884 the new railroad tax act was passed, and it was believed that the provisions of the bill would cover the Morris & Essex. The hope was also expressed that the company would consider the justice of the new tax act and voluntarily obey it. The New Jersey courts at the November term decided otherwise, sustained the contract and permitted the road to go free. Not only were the interests of the state at large adversely affected, but every municipality in which the company had property thus lost a considerable addition to the ratables, while all the other railroads found themselves paying tax to a considerable sum while a competitor escaped much more easily. Hence action to force the Morris & Essex Co. to consent to the tax act of 1884, under the penalty of losing the still more valuable provisions of the charter.

Ex-Governor Bedle is going to try and explain why the corporation should not pay the same rate of taxation as other roads. His principal argument will be that the present lease with the Delaware, Lackawanna & Western will be destroyed if the road be condemned and the stock depreciated in value. The company can throw up its charter and take a new one under the general railroad law.

The State Railroad Assessors have submitted their report, showing that this company has withheld from the state no less than $1,246,292. As the Morris & Essex was leased to the Delaware, Lackawanna & Western in 1866 the latter corporation is therefore held liable for whatever sum the Courts may declare to be due.

There was a reconsideration of the bill to repeal the charter of the company by the House of Representatives of New Jersey, for the purpose of offering an amendment providing that if the company before June 1 files an instrument to be approved by the Attorney-General, waiving the right to its special contract, the act shall not go into effect, and the state shall surrender its right to take the property of the company. As amended the bill was passed 55 to 0.

**Murphy, Ducktown & Cleveland.**—The charter of this North Carolina and Tennessee road has been transferred to a New York company that agrees to locate the line and begin grading within 4 months. It will connect with the Marietta & North Georgia narrow-gauge road, now running north to the North Carolina state line.

**Newburg & Poughkeepsie.**—This company is reported organized to build a road from the line of the New York, Lake Erie & Western in Newburg, N. Y., through Marlborough to Highland, there to connect with the Poughkeepsie Bridge. Length of road about 20 miles. Capital stock, $500,000.

**New Road.**—A stock company has been organized in Columbus, Ind., to construct a road from Columbus to Switz City, 65 miles, the road to be operated by the Cincinnati, Indianapolis, St. Louis & Chicago. Capital stock, $3,000,000. The company asks a subsidy of $45,000 from the township of Columbus, and will guarantee to have the road in operation through the township within a year, if the subsidy is given.

A road is building from Portsmouth, Va., westward. Seventeen miles are already graded. The engineers will not say who is doing it.

At the meeting of the Railroad Committee, held in Camden, Me., it was decided to survey for a road from Rockland to Camden. A syndicate for building the road has already been formed, but after the road has been surveyed Camden will be called upon for monetary aid.

**New York, Chicago & St. Louis.**—A decree has been entered by Henry S. Sherman providing for the sale of this road for a sum not less than $18,000,000, of which sum not less than $100,000 is to be paid down. The decree recognizes the validity of both the first and second-mortgage bonds. The claims are to be paid in the following order: Costs of suits, services of trust companies, receivers' certificates, first-mortgage bonds and interest, second-mortgage bonds and interest. All the parties to the original suit were represented in court and general consent was given to the decree.

**New York, Lake Erie & Western.**—This company has just closed a contract with the Union Switch & Signal Co. to equip with block signals their entire main line from Jersey City to Turners, at a cost of $40,000. Interlocking apparatus is to be put in at both ends of the Bergen tunnel, at the junctions of the various branch lines doing suburban business and on the main line. Also at all grade crossings with other railroads. The block system is to be an absolute telegraphic block with Sykes attachment, dividing the line into sections of from 1.5 to 3 miles.

The track at Niagara Falls is to be extended to another site in the town and a new station is to be built, provided that right of way can be obtained.

This company has agreed to guarantee payment of the first mortgage bonds of the Chicago & Atlantic and to give stockholders 40 per cent. of their holdings in new incomes. The second mortgage bonds will receive an income bond which will rank next to the firsts, and the beneficiary certificates that represent the stock will receive 40 per cent. of their face value in income bonds. Stock of new company will be $100,000 and will be given to the New York, Lake Erie & Western for its guarantee. The Chicago & Atlantic was built in order to give the New York, Lake Erie & Western a connection with Chicago.

The Erie is building a 40-ft. extension to its freight depot at Warsaw, N. Y., and will build a new passenger station at Pendleton Centre, Niagara County, N. Y.

Tracks are being laid from the Paterson branch to an immense abattoir now building on the meadows a mile beyond East Newark, N. J., by the Swift Meat Co.

The Morris & Essex will also build a spur track to the establishment.

**New York, Rutland & Montreal.**—President W. H. Stevenson has taken formal charge of this road's office at Bennington, Vt. It is reported that President Bostwick, of the Housatonic, has obtained control of the New York, Rutland & Montreal, and that after obtaining possession of the Bennington & Rutland and building the track between the State line and Bremard's station, through trains will be run between New York and Montreal, by way of Bennington and the Housatonic Valley. Mr. Stevenson says the connecting link of track will be finished within 60 days.

**Niagara & San Jacinto.**—Articles of incorporation have been filed in California. The company will build a standard gauge road from the town of Niagara to San Jacinto, San Diego County, Cal. The estimated length of road is 18 miles. Principal place of business, San Diego. Capitol stock is $200,000, divided into 2,000 shares of the par value of $100 each.

**Norfolk & Western.**—The surveyors have started an extension from Bristol, Tenn., to Rockwood, 170 miles. Chattanooga is 70 miles from Rockwood. Entrance to the former city will be made over the Cincinnati Southern. The Norfolk & Western intends also to build from Rockford to Nashville, Tenn.

This company has completed a grain elevator at Norfolk, Va., which has a capacity of 150,000 bushels.

**Northern Pacific.**—It is reported that this company and the Grand Trunk have made an agreement by which the former is to build a line from Crookston, Polk County, Minn., to the Canadian boundary, where the Grand Trunk will meet it with another line, extending via Winnipeg to Portage La Prairie there connecting with the Manitoba & Northwestern. The Grand Trunk is said to have purchased the last named road.

**Ohio & Mississippi.**—In the case of the Baltimore & Ohio against this company relating to the carrying of express matter over the latter's lines, the judge has decided in favor of the Ohio & Mississippi. The case rested on a question whether a contract made between the companies three years ago was perpetual, or could be terminated by either party upon giving proper notice. Notice had been given by the Ohio & Mississippi ten days ago, and the Court sustained them in their action.

**Oregon Railway & Navigation Co.**—On the branch of this road, from Walla Walla, Washington Ter., to Pendleton, Oregon, the total length of bridging in 12 miles is 3,500 ft. The largest bridge is 1,100 ft. long. Near Blue Mountain station the road crosses Dey Creek on a high trestle, and comes back down the creek forming a large horseshoe. Part of the road along Blue Mountain has a grade of 106 ft. to the mile.

**Orange Belt.**—The contract for grading the road from Macon, Fla., to Point Pinellas, on the Gulf, has been let to Mr. McLain, of Kissimmee, Fla.

**Paducah, St. Louis & Chicago.**—This company has been incorporated in Illinois. It is proposed to build a road from the Ohio River, in Pope County, Ill., to Eldora, in Saline County, Ill. Capital stock, $100,000.

**Pennsylvania.**—The annual meeting of the stockholders was held in Philadelphia on March 8. The report already published was read. President Roberts was asked for his opinion of the Inter-state Commerce law. He said: "I do not think that those inland lines not subject to water competition," he continued, "will be seriously affected. From an examination of our business I find there has been more conformity with the ideas incorporated in the act than any other line because we came under the operation of a law similar in character when we obtained our main line from the state. If the law does not work there will be violent strife, as the system of pooling is abolished and no means are left to counteract cutting of rates, except at the end of the struggle.

"It will be readily understood that a complete transformation of all the systems of conducting the business of the transportation companies of the country, as provided by the bill, could not be accomplished without a great deal of violence to the business of the country and of the railroads. I am sure that the bill has quite as many good features for the railroads as for the public."

Mr. W. E. Lockwood was strenuous in the matter of allegations against the directors of the company concerning its contract with the Pullman's Parlor Car Co., and the Adams Express Co. He opposed a resolution of thanks to the President and officers of the company which was offered by Mr. Elkins. Mr. Lockwood himself offered a valo-

gistic resolution as to the death of his former colleague, the late Edwin Parker. The motion was ruled out. It was then moved that all of Mr. Lockwood's questions be submitted to the President with the request that he answer them at the next annual meeting. This was defeated. Then the meeting adjourned.

Contracts for straightening the road between Menlo Park and Metuchen, N. J., and near Trenton, have been awarded to Charles McFadden, of Philadelphia, and B. M. & J. F. Shanley, of Newark, N. J.

The Division Freight Agents have received thorough instruction as to carrying into effect the reduced number of freight classifications which the company will observe under the inter-state bill. The officials say that the provisions of the bill will be complied with without any friction whatever.

The company is laying seven new tracks in Philadelphia, from Fifty-first to Sixty-fifth street, to provide for an increase of traffic.

**Peoria & St. Louis Air Line.**—Incorporated in Illinois, to build a road from Peoria, Ill., to East St. Louis, Ill. Capital stock, $1,000,000. Principal offices at Petersburg, Ill.

**Philadelphia & Reading.**—Judge McKennan in the Robinson suit for the foreclosure of this property has confirmed the masters' report, and has made a decree directing, in default of the payment by June 7, 1887, of the coupons upon the general mortgage bonds maturing prior to and on Jan. 1, 1887, that the road and its franchise shall be sold to satisfy the mortgage claims. One exception to the masters' report made by the railroad company was sustained by the judge's ruling. This exception reads: "Because the learned masters have erred in finding that the privilege of the bonds secured by the general mortgage of the Philadelphia & Reading Company, bearing date July 1, 1874, amounting to the sum of $24,686,000, is now payable and due."

The management has decided to equip yards and wharves of the company at Port Richmond, Philadelphia, and to make them an important point for the distribution of all kinds of freight. The big shipyard buildings will be converted into a bonded warehouse for the storage of merchandise, and vessels can be loaded with a mixed cargo as well as with coal. Improvements to an expense of $200,000 are already planned.

The management has a concentration of power system in contemplation which will be put into its coal and iron department with the view of dispensing with many officials and save large amounts of money. It applies to the details of mining coal.

**Philadelphia Street Railroad.**—Fares on all street lines in Philadelphia have been reduced from 6 to 5 cents. Influential citizens rose up and said it had got to be. And it is.

**Pittsburgh & Western.**—The company will complete the road which was surveyed some years ago between Evergreen and Perrysville, Pa., and will extend the road to the main line at Jack's Run. Length of road about 8 miles.

**Portage Air Line & Pacific.**—It is reported that Mr. Hawley of Chicago has bought from John E. Burton the graded right of way of the above named road. This is from Geneva Lake, Wis., to a point within a few miles of Portage, Wis. It crosses one branch of the Chicago, Milwaukee & St. Paul at Elkhorn and another branch at Whitewater.

**Potomac & Piedmont Coal and Railroad Co.**—Gov. Wilson, of West Virginia, has vetoed a bill entitled "An act to change the name of the Potomac & Piedmont Coal and Railroad Company, and confer additional powers." The bill, as introduced by Speaker Price of the Senate, gave to the railroad company almost unlimited rights. The Governor vetoes the bill on the ground of its being unconstitutional.

**Puget Sound & Gray's Harbor.**—The company now has 9 miles of road laid with steel rails in Washington Ter. The road is the property of the Fort Blakely Mill Co. In a short time there will be 5 logging camps along the line, getting out about 200,000 ft. of logs a day, which will be transported over the road. It is proposed to build a ten-mile section of additional road to Elma, in Chehalis County. T. W. Lake has just completed 3 bridges for the company.

**Richmond & Danville.**—The Washington, Ohio & Western Division consolidated with the Virginia Midland on March 1.

**St. Louis, Arkansas & Texas.**—The preliminary survey has been made from Commerce to Greenville, Tex., 15½ miles.

**St. Louis, Iron Mountain & Southern.**—The Texas express which left St. Louis, Mo., at 9:30 o'clock, on March 5, plunged through a bridge over Joachim Creek about an hour later. Two persons were drowned and several injured.

**St. Louis & San Francisco.**—It was stated last week that Mr. Jay Gould had acquired control of this road, and that it would become an important part of the Missouri Pacific system. Mr. Gould has denied the statement in the most emphatic terms. The road is a very useful and extensive one, the main line being from St. Louis, Mo., to Seneca, 326 miles, the Kansas City Division from Peirce City, Mo., to Wichita, Kan., 218 miles: Arkansas Division from Plymouth, Mo., to Fort Smith, Ark., 134 miles; White River Branch, 35 miles, and 4 other branches. It has an equal interest with the Atchison, Topeka & Santa Fe in the Atlantic & Pacific enterprise. Whether it will eventually become a part of the Missouri Pacific system or not, does not seem absolutely certain just now.

This company has completed its new line from Fayette Junction, Ark., to Powell, Ark., a distance of 25 miles. The line is now being operated as the Fayetteville Branch.

Sixty-four miles of track have been laid on the extension from Fort Smith, Ark., south to Paris, Tex., and from Paris, north, 16 miles, have been laid.

The officials of this company have issued the following statement showing the yearly increase of mileage and the decrease per mile of the capital stock and bonded indebtedness from the date of the company's organization to the present time:

| Year. | Miles. | Capital stock. Amount. | Capital stock. Per mile. | Bonded in'b'dness. Amount. | Bonded in'b'dness. Per mile. |
|---|---|---|---|---|---|
| 1878..... | 293 | $21,281,000 | 72,631 | $12,861.000 | $43,894 |
| 1879.... | 293 | 21,292,100 | 72,669 | 12,811,000 | 43,723 |
| 1880.... | 558 | 22,063,000 | 39,539 | 13,911,000 | 24,930 |
| 1881.... | 635 | 23.878.400 | 37,604 | 17,900.000 | 28.189 |
| 1882.... | 661 | 23.878.400 | 36,124 | 18.650,000 | 28,214 |
| 1883.... | 725 | 24,448,200 | 33,721 | 20,364,000 | 28,088 |
| 1884.... | 776 | 24,448,200 | 31.621 | 22,102,000 | 28,481 |
| 1885.... | 815 | 24,538,200 | 30.108 | 23,893,000 | 29.316 |
| 1886.... | 815 | 26,022,500 | 31,929 | 26.026,000 | 31.933 |
| 1887 .... | 930 | 26,100,300 | 28,065 | 27,806.000 | 29,898 |
| 1888....1,180 | | 26,190,300 | 22,110 | 33,180,000 | 28,118 |

The figures shown for 1888 are as they will be on July 1, 1887, upon the opening before that date of additional mileage now nearing completion.

**St. Paul, Minnesota & Northwestern.**—The company has given notice of its withdrawal from the Northwestern Freight Association on account of dissatisfaction with the arbitrator's award of percentages.

**Savannah, Florida & Western.**—This company has made a proposition to the people of Monticello, Jefferson County, Fla., that if they will prepare the roadbed ready for laying the rails from Monticello to the Georgia state line, and provide depot grounds in Monticello, the company will complete and operate the road between Monticello and Thomasville, Ga. The same proposition is made to the people of Tallahassee, Fla. It is likely to be accepted and the road built between Thomasville and Tallahassee.

**Seattle, Lake Shore & Eastern.**—The contract for grading, bridging, putting in culverts and drains, and riprapping of 5 miles of this road, beginning at Smith's Cove, Seattle, Washington Ter., and extending to Union Bay, on Lake Washington, has been let to Kerns Brothers, of Seattle. The work must be completed by May 1. The contract for furnishing piling has been let to Allen & Nelson, Seattle.

**Selma & Alabama.**—A company of this name has filed a charter at Montgomery, Ala.

**Solomon Valley, Gypsum & Gulf.**—Incorporated in Kansas. The proposed road is to extend from Concordia, Kan., south to Gypsum City, and thence to the Gulf of Mexico.

**South Atlantic & Northwestern.**—The people of Richmond County, N. C., have voted down the bill for the county subscription of $160,000 to the capital stock of this road. The line is planned to extend from Smithville on the coast of North Carolina to Bristol, Tenn.

**South Carolina.**—This company has contracted for the transportation of iron from Birmingham, Ala., and Chattanooga, Tenn. At present the shipments per week will consist of from 500 to 1,000 tons of pig iron. It will be conveyed first to Charleston, S. C., from which place it will be shipped to New York by the Clyde steamers.

**Springfield & Southern Illinois.**—Work is to begin on this new road, and will be continued from this time on as rapidly as possible. The line will run from Springfield, Ill., to Pinkneyville, Ill., a southeastern direction, passing through Sangamon, Montgomery, Washington, Clinton, Perry and Bond counties, connecting Springfield directly with Hillsboro, Greenville, Nashville, Pinkneyville, all county seats, with the state capital, and also giving them direct connection with Chicago, by use of the Chicago & Alton and Wabash, St. Louis & Pacific. The road will be 130 miles long, and 15 miles have already been graded in Sangamon and Montgomery counties.

**Stewartstown.**—The report of this road for 9 months ending Dec. 31 is quite satisfactory, and is illustrative of the fact that with economical management a local road can be made more than self-sustaining. This road extends from New Freedom, Pa., to Stewartstown, 7.3 miles. In contrast to the losing methods of many larger corporations, the earnings of this little road for 9 months are given below: Gross earnings, $8,669; operating expenses, $3,827; net earnings, $4,842; gross earnings per mile, $1,231; net earnings per mile, $672; per cent of expenses, 44.1 per cent. During the year the ballasting of the entire line with stone ballast has been completed. In the meantime there has been no accident to passenger or employé.

**Tennessee Midland.**—A special meeting is announced of the Shelby County, Tenn., Court, for March 21, to consider the submission to the people of a proposition that the county shall subscribe for $200,000 worth of the capital stock of the above company. The road is to connect Memphis with the Richmond & Danville at the Virginia state line. The proposition is that the county shall issue its bonds, payable in 20 years and bearing 6 per cent. interest, for the stock taken. The bonds will be issued when the road is completed from Memphis to the Tennessee River, which result is promised within a year. The vote will probably be favorable to the proposition.

**Terre Haute & Peoria.**—Manager Conklin has just received 2,000 tons of new steel rails and over 60,000 ties, with which he will commence building the old road. They are now being distributed at Lake City, Ill.

**Texas & Pacific.**—About 2,000 men are to be put to work at once upon this road's new line between New Orleans and Shreveport, La. The cuts in the road north of Alexandria, La., will be all rock ballasted, and new steel rails will be laid throughout. Messrs. Green & Brogue will have 400 men at work, Rogers & Ballentine will employ 1,000 men inclusive of convicts, while Messrs. Knowlton & Co. will have about 600 men on the work.

**Toledo, Peoria & Western.**—A meeting of the first-mortgage bondholders has been called for March 31 in New York to form a new company. It is proposed to issue $5,000,000 4 per cent. bonds and $5,000,000 stock. The old bondholders will receive 100 per cent. in new firsts and also 100 per cent. in new stock. The road was sold under foreclosure for $4,790,000, which was $363,000 more than the total bonded debt.

**Valley & Elk River.**—A charter has been issued to this company in West Virginia. The proposed road will begin at Beverly, Randolph County, and run from there by the most practicable route to Braxton Court House in Braxton County.

**Wabash, St. Louis & Pacific.**—Mr. Henry Crawford appeared before Judges Brewer and Thayer at St. Louis this week and presented a hot argument in support of the intervening petition recently filed by the first mortgage bondholders of the Chicago Division, which asks for the division of $1,315,350 of the surplus earnings of the Chicago Division before the receivers be allowed to give the Purchasing Committee possession of the lines west of the Mississippi. Mr. Crawford said that the Chicago Division had always been profitable and that it was nothing less than robbery to saddle it with the aggregate indebtedness of the bankrupt lines that paralyzed the system. He believed the lines that created the deficit should bear the burden of the debt. After seven hours argument on the part of Mr. Crawford the judges took the points under consideration. If the decision is adverse the Purchasing Committee will file its bonds and take possession of the west lines.

The decision on the intervening petition offered by bondholders of the Chicago division will not be rendered till March 21. The Purchasing Committee cannot take possession of the lines until the decision is given.

**Wabash Western.**—The corporation succeeding the Wabash, St. Louis & Pacific has abandoned the name first selected, that of the Wabash, St. Louis & Western, and a new set of articles, with the Wabash Western as the name of the company, have been filed at Jefferson City, Mo.

**Williamstown & North Adams.**—The movement for the revival of the charter of this road is being earnestly pushed. The leading manufacturers of North Adams, Mass., have petitioned the Legislature in favor of the project. The railroad committee has given a hearing on the matter. Francis Smith, Vice-President of the Boston, Hoosac Tunnel & Western road, said that they proposed to spend $2,000,000 to $4,000,000 to open the road in Massachusetts. A through line is in contemplation from Rotterdam Junction, N. Y., to Duluth, Minn., north through Canada, so as to avoid competition with the New York companies. The line is laid out from Sault Ste. Marie, Mich., to Duluth. Boston is thus 300 miles nearer Duluth than now, and the main line of the road would be 1,200 miles long. The road in this state would be a 40-mile link in a 1,200-mile chain. What is wanted is liberty to consolidate with the New York corporation so as to make a through line. This cannot be done under the present law.

President Yeamans of the New Haven & Northampton spoke in favor of the petition. His road did not propose to take part in the building of the line, but a new independent line was needed now that the Fitchburg controlled the Hoosac Tunnel. President Aldrich of the Central Massachusetts indorsed the petition for the renewal of the charter. Geo. A. Torrey, counsel for the Fitchburgh company, opposed the granting of the petition.

**Wisconsin Central.**—It is reported that this road intends building a new road from Portage, Wis., to Burlington. An old roadbed covers the greater part of the distance, the grade having been made 30 years ago. There is a land grant to be contested for, but it is thought the new road will be pushed to completion notwithstanding this, as the route will shorten the Wisconsin Central's line between Chicago and St. Paul by 30 miles or more.

**Wisconsin Midland.**—Articles of incorporation have been filed at Madison, Wis. A road is to be built from Chicago, Ill., to Fond du Lac, thence up the east side of Lake Winnebago to Florence and from there into Michigan, either to Ontonagon or L'Anse. From Calumet County a branch is to be run to Sturgeon Bay. Capital stock is $3,000,000.

**Wyandotte & Northwestern.**—Three corps of engineers are out permanently locating the line from Menager Junction to Beatrice, Neb. Grading is in progress, and steel rails are arriving in large quantities. Tracklaying begins this week.

## ANNUAL REPORTS.

### Cleveland, Columbus, Cincinnati & Indianapolis.

The company owns a line of road from Cleveland, O., to Columbus, O., 138 miles; from Delaware to Springfield, O., 50 miles, from Galion to Indianapolis, 203.15 miles; and it leases the Cincinnati & Springfield, 80.50 miles; the Mount Gilead Short Line, 2 miles; and the Indianapolis & St. Louis, 265 miles; total length of line operated, 738.65 miles.

The statement of the Cleveland, Columbus, Cincinnati & Indianapolis for the year ending Dec. 31 is as follows:

| | 1886. | 1885. | Inc. or Dec. | P.c. |
|---|---|---|---|---|
| Earnings..... | $4,184,118 | $3,669,439 | I. $514,679 | 14.0 |
| Expenses..... | 3,592,723 | 3,728,608 | D. 135,885 | 3.6 |
| Net earnings.... | $591,395 | *$59,169 | I. $650,563 | ... |
| Gross earn. per m.. | 10,701 | 9,384 | I. 1,317 | 14.0 |
| Net " " .. | 1,513 | ..... | .. .. | .... |
| P. c. of expenses.. | 85.8 | 101.6 | D. 15.8 | .... |

* Deficit.

The statement of the Cincinnati & Springfield for the year is as follows:

| | 1886. | 1885. | Inc. or Dec. | P.c. |
|---|---|---|---|---|
| Earnings..... | $1,130,324 | $886,104 | I. $244,220 | 25.4 |
| Expenses..... | 1,215,472 | 1,069,930 | I. 145,542 | 13.6 |
| Net earnings ... .... | *$85,148 | *$183,826 | ..... | .... |

* Deficit. Decrease in deficit, $98,678.

The earnings of the Indianapolis & St. Louis for the year have been:

| | 1886. | 1885. | Inc or Dec. | P.c. |
|---|---|---|---|---|
| Earnings..... ... | $1,876,494 | $1,855,903 | I. $ 0.591 | 1 1 |
| Expenses..... ..... | 2,312,075 | 2,476,732 | D. 164,657 | 6.6 |
| Net earnings..... | *$431,581 | *620,829 | ... ..... | .... |

* Deficit. Decrease in deficit, $185,248.

The gross earnings of the Cleveland, Columbus, Cincinnati & Indianapolis, the Cincinnati & Springfield, and the Indianapolis & St. Louis roads for the year ending Dec. 31 were as follows:

| | 1886 | 1885. | Inc. or Dec. | P.c. |
|---|---|---|---|---|
| Earnings..... | $7 190,936 | $6,411,446 | I. $779,490 | 12.1 |
| Expenses..... ... | 7,120 271 | 7,275,271 | D. 155,000 | 2.1 |
| Net earnings ..... | $70,665 | *$863,825 | I. $934,490 | .... |

* Deficit.

### Illinois Central.

This company owns lines of road from Chicago, Ill., to Cairo, Ill., and from Centralia, Ill., to Dubuque, Ia., 705.53 miles; branches owned are 411.36 miles; lines leased, 402.16 miles; a total of 2,066.35 miles. Statement for year ending Dec. 31:

| | 1886. | 1885. | Inc. or Dec. | P.c. |
|---|---|---|---|---|
| Earnings..... .... | $12,529,493 | $12,621,264 | D. $91,771 | 7.2 |
| Expenses..... | 7,790,541 | 6,626,649 | I. 1,163,912 | 17.5 |
| Net earnings..... | $4,738,952 | $5,994,635 | D. $1,255,683 | 20.9 |
| Gross earn. per m.. | 6 064 | 6 168 | D. 44 | 0.7 |
| Net " " .. | 2,293 | 2,901 | D. 608 | 20.9 |
| P. c. of expenses... | 62.1 | 52.5 | I. 9.6 | .... |

The net receipts from all sources were:

| | | | | |
|---|---|---|---|---|
| Traffic ..... | $4,738,952 | $5,994,635 | D. $1,255,683 | 20.9 |
| Surplus fund..... | 294,190 | 294,138 | I. 52 | .... |
| Lands..... | 102,121 | 55,915 | I. 46,206 | 82.6 |
| Interest ..... | 147,393 | 111,997 | I. 35,396 | 31.6 |
| Total.. ..... | $5,282,656 | $6,456,685 | D. $1 174,029 | 16.6 |
| Deduct rentals, taxes, interest on debt, sink'g fund, and improvem t expenses..... ... | 2,949,874 | 3,842,496 | D 892,622 | 23.2 |
| Balance..... | $2,332,782 | $2,614,189 | D. 281,407 | 10.7 |
| Dividends paid..... | 2,030,000 | 2,320,000 | D. 290,000 | 12.5 |
| Bal. for the year. | $302 782 | $294,189 | I. 8,593 | 2 9 |

### Oregon Short Line.

The property is controlled by the Union Pacific. The line is from Granger, Wyoming, to Huntington, Oregon, 540.93 miles, with a branch of 69.69 miles, a total of 610.62 miles. The statement is for the year ending Dec. 31.

| | 1886. | 1885. | Inc. or Dec. | P. c. |
|---|---|---|---|---|
| Earnings ..... | $1,942,107 | $1,833,190 | I. $108,917 | 5.9 |
| Expenses... ..... | 1,349,421 | 1,184,873 | I. 164,548 | 13.8 |
| Net earnings..... | $592,686 | $648,317 | D. $55.631 | 8.5 |
| Gross earn. per mile. | 3.183 | 3,005 | I. 178 | 5.9 |
| Net " " " | 971 | 1.062 | D. 91 | 8.2 |
| Per cent. of exps... | 69.4 | 64.6 | I. 4 8 | .... |

Taxes for 1886 were $87,309; 1885, $92,356; decrease, $5,047. Surplus for 1886, $507,376; 1885, $557,959; decrease, $50,583, or 9.0 per cent.